

BUYERS SPECIFIC ADDITIONAL TERMS & CONDITIONS

ITEM NAME: Mandatory spare for LT Switch Gear for OPU and Auxiliary Contact Set of each type & rating for OPU

PROJECTS- PANKI AND UDANGUDI**1. SCOPE OF ENQUIRY:**

2. Sl. No.	Material Code & Item Description	Total Qty.	LOT Quantity & Delivery schedule
1.	W90318103630 DRG: 41810F51002 REV:00 MANDATORY SPARE FOR LT SWITCH GEAR OF OPU AS PER DOCUMENT NO 41810F51002	1 Set	Panki: 1 Set -20/06/2025
2.	W90318036010 DRG: 41810F61009 REV:00 AUXILIARY CONTACT SET OF EACH TYPE & RATING FOR OPU AS PER DOC NO. 41810F61009	1 Set	Udangudi: 1 Set -30/05/2025

2. Project Details with consignee address:

Project Name	UDANGUDI STPP STAGE-I, (2X660 MW)	PANKI TPS EXTN (1X660 MW)
Consignee Address	SE/ PROJECTS 2X660MW UDANGUDI STPP STAGE-I TAMIL NADU GEN. & DIST. CORP. UDANGUDI, THOOTHUKUDI-628215	CHIEF ENGINEER (PROJECTS) 1X660MW UPRVUNL PANKI TPS EXT. PANKI, KANPUR PIN 208020

3. BUYERS SPECIFIC ADDITIONAL TERMS & CONDITIONS IN ADDITION TO GTC

Sl. No.	Terms	Description	Supplier confirmation
1.	Documents Checklist:	Please submit signed and stamped copy of your offer on each page along with following documents; <ul style="list-style-type: none"> • Buyer Specific T&C. • Technical PQR & its supportive document. • Technical drawing & purchase specification. • Certificate/self-certification for minimum local content as per PPP-MII order. • Replica of price bid schedule without prices with part-I offer. 	
2.	Special Instruction of Technical requirement	a) WARRANTEE REQUIRED FOR 18 MONTHS FROM DATE OF DISPATCH. b) MATERIAL SHOULD BE PACKED PROPERLY IN GREEN COLORED BOXES & PROPER LABELLING LIKE ITEM DESCRIPTION, PO ETC. SHOULD BE MARKED ON BOX. c) ITEM WISE PACKING LIST TO BE PROVIDED.	
3.	Compliance of GTC on GeM	General Terms and Conditions on GeM 4.0 (Version 1.25) Dtd -05/05/2025 or it's latest revision of GeM portal shall be applicable against this enquiry. Kindly confirm to compliance the same for this tender.	
4.	Pre-Qualification Requirements	The Pre-Qualification Requirements have been compiled. All the bidders should ensure submission of complete details and documents as called for in these requirements. The Offers submitted by the bidders would be scrutinized with respect to Pre-Qualification Requirements first. Techno-Commercial offer of only those bidders shall be evaluated who meet the Pre-Qualification Requirements.	

5.	Compliance of Rule 144 (xi) of GFR 2017	Compliance of Restrictions under Rule 144 (xi) of GFR 2017 shall be as per GeM.	
6.	Bid validity/ Validity of offer	Please note that validity of the offer shall be 180 days from the date opening of Techno-Commercial bid (Part-I bid) on GeM portal. Offer of bidder's having validity less than 180 days shall liable to reject. Please confirm.	
		The required validity is considering that offer is complete & clear w.r.t. PQR and all techno-commercial conditions. Vendors need to extend their offer validity for the time taken by them in responding BHEL's comments/clarification sought during techno-commercial scrutiny of the offer. In case regret by any bidder for such validity extension, their offer shall liable to be reject. Please confirm.	
7.	Loading and unloading	Vendor's scope will not cover Loading & Unloading at Final destination of delivery. Unloading at final destination (i.e. BHEL site) is in BHEL 'scope. Loading and unloading at other intermediate places due to any permitted transshipment will be the responsibility of the vendor. Kindly note	
8.	Prices/Basis of Quotation	The offered prices of the items shall remain firm and fixed till the execution of the contract, kindly confirm.	
		In GEM, PRICE to be offered all inclusive. Accordingly, Kindly make sure your quote prices are inclusive of P&F, Freight & GST etc.	
		Transit Insurance would be arranged by BHEL. Please quote your prices accordingly.	
		The prices are to be quoted on Ex-Works with freight Pre-paid up to project destination basis & inclusive of all taxes & duties, GST (i.e. Inclusive all). Bidders can dispatch goods through any Indian Bank Association approved transporters having their branch at HARIDWAR / destination. If material is dispatched through other than Indian Bank Association approved transporter, material to be delivered on door delivery basis. In case of dispatch of material through any other unapproved transporter, payment shall be made only after receipt of material and any additional charges payable to the transporter shall be to the bidder's account. Any demurrage / godown rent payable to the transporter /or to godown's owner due to any delay attributed by the supplier shall be recovered from supplier's account.	
9.	Special Instructions:	<ul style="list-style-type: none"> • ORIGINAL (GR/LR, MDCC, PKG LIST) ARE REQUIRED FOR BILLING. • MATERIAL IS TO BE DESPATCHED ON DOOR DELIVERY BASIS TO SITE. • MATERIAL IS TO BE PACKED IN SUITABLE, WATER PROOF, JURK PROOF, DUST PROOF BOX. • ITEM WISE PACKING LIST WITH BBU NO. IS REQUIRED. • MANDATORY SPARES TO BE MARKED ON BOX. • Shipping BOX should be painted green in color and marked with MANDATORY SPARE FOR LT SWITCH GEAR OF OPU, project name-Panki on at least 4 sides of the box. • Shipping BOX should be painted green in color and marked with AUXILIARY CONTACT SET OF EACH TYPE & RATING , project name-Udangudi on at least 4 sides of the box. • Vendor to ensure submission billing documents in the same month of material despatch. If vendor fail to provide the despatch documents in the same month GST Penalty shall be applicable and bear by vendor as per GST rule. 	
10.	Evaluation criteria	Evaluation shall be done based on total landed cost item wise consignee wise up to BHEL Project site.	
11.	Evaluation Currency	The evaluation currency for this tender shall be INR.	

12.	Payment terms:	For Material portion: The payment shall be done after receipt of Material at BHEL respective project site, within no. of days as defined in the below table from the date of receipt of Material at site i.e. MRC date). <table><tr><td>Type of Bidder</td><td>Payment Terms (Number of Days)</td></tr><tr><td>Micro & Small Enterprises (MSEs)</td><td>45 days</td></tr><tr><td>Medium Enterprises</td><td>60 days</td></tr><tr><td>Non MSME</td><td>90 days</td></tr></table> The Payment terms are subject to receipt of non-discrepant document from supplier.	Type of Bidder	Payment Terms (Number of Days)	Micro & Small Enterprises (MSEs)	45 days	Medium Enterprises	60 days	Non MSME	90 days	
Type of Bidder	Payment Terms (Number of Days)										
Micro & Small Enterprises (MSEs)	45 days										
Medium Enterprises	60 days										
Non MSME	90 days										
13.	GeM charges	GeM charges if any shall be either side only i.e. buyer's GeM charges shall be in buyer's account and seller's GeM charges shall be on seller's account. Please confirm.									
14.	Contract execution	Bidder's are advised to read GeM related query & clarification carefully on GeM portal. Order shall be executed through GeM.									
15.	Reverse Auction	BHEL shall be resorting to Reverse Auction (RA) on GEM portal as per GEM functionalities for this tender with elimination of H1 bidder.									
16.	Delivery Period	Please note that BHEL's Delivery requirements are mentioned above at Sl. No.1 of ATC. Early delivery w.r.t. above lot delivery will be accepted only after written confirmation from BHEL. BHEL reserve right to reject early delivery request of bidders / suppliers. Delivery period indicated in GeM bid is only indicative and final delivery of tender shall be taken as mentioned above. Accordingly bidders to confirm the above deliveries or quote their best possible delivery in no of months / weeks from the date of placement of Purchase order, including all activities like document approval, inspection by TPI time etc.									
17.	Technical Document/ Drawing approval conditions	Drawings/Data sheets/documents/QAP etc. as called for in the specifications shall be submitted by Vendor for BHEL/ Customer approval within 30 days of purchase order. BHEL shall approve these drawings/data sheets/ documents / QAP etc. within 30 days of receipt. Any comments on the documents shall be given by BHEL within 7 days of submission and vendor shall submit revised document / reply to comments, within 7 days of BHEL comments. However, total time for Document submission and approval shall not exceed 30 days for respective party. Delivery is from the date of PO, accordingly, delay in submission / revision of the documents by the vendor will automatically account for to vendor. In case of delay on account of BHEL in comments / approval of the documents, the delivery shall be re-scheduled by the no of days taken by BHEL in excess to 30 days. For delay analysis cumulative no of days (including time taken in comments), shall be considered for delivery extension.									
18.	Liquidated Damages (LD) for late delivery	Liquidated Damages shall be lot wise as per clause no. 15 (iii) of General terms and conditions on GeM 4.0 (Version 1.24) as under: kindly confirm. "If the Seller/Service Provider fails to deliver any or all of the Goods/Services within the original/re-fixed delivery period(s) specified in the contract, the Buyer will be entitled to deduct/recover the Liquidated Damages for the delay, unless covered under Force Majeure conditions aforesaid, @ 0.5% of the contract value of delayed quantity per week or part of the week of delayed period as pre-estimated damages not exceeding 10% of the contract value of delayed quantity without any controversy/dispute of any sort whatsoever". The date of LR would be treated as the date of delivery for penalty purposes.									
19.	MDCC clause	Please note that, material shall be dispatched only after issue of Material dispatch clearance certificate (MDCC) from end customer. For issue of MDCC, vendors are required to submit all test certificates (TC) and inspection report of third party (IR) to BHEL. After review & acceptance of the quality document, BHEL will forward the same to end customer for issuance of MDCC. MDCC shall be issued within 7 days of receipt of complete quality documents / TCs,. In case of delay in issuance of MDCC, only delivery shall be extended by no of days taken by BHEL in excess to 7 days and all other terms and conditions of PO shall remains same & binding. In case any material is dispatched without MDCC and any loss is incurred by Supplier/Vendor for any reason whatsoever, BHEL shall not be responsible in any manner to compensate the supplier in this regard.									

		Kindly confirm.	
20.	BREACH OF CONTRACT, REMEDIES AND TERMINATION:	<p>The following shall amount to breach of contract:</p> <p>I. Non-supply of material/ non-completion of work by the Supplier/Vendor within scheduled delivery/ completion period as per contract or as extended from time to time.</p> <p>II. The Supplier/Vendor fails to perform as per the activity schedule and there are sufficient reasons even before expiry of the delivery/ completion period to justify that supplies shall be inordinately delayed beyond contractual delivery/ completion period.</p> <p>III. The Supplier/Vendor delivers equipment/ material not of the contracted quality.</p> <p>IV. The Supplier/Vendor fails to replace the defective equipment/ material/ component as per guarantee clause.</p> <p>V. Withdrawal from or abandonment of the work by the Supplier/Vendor before completion as per contract.</p> <p>VI. Assignment, transfer, subletting of Contract by the Supplier/Vendor without BHEL's written permission resulting in termination of Contract or part thereof by BHEL.</p> <p>VII. Non-compliance to any contractual condition or any other default attributable to Supplier/Vendor.</p> <p>VIII. Any other reason(s) attributable to Vendor towards failure of performance of contract. In case of breach of contract, BHEL shall have the right to terminate the Purchase Order/ Contract either in whole or in part thereof without any compensation to the Supplier/Vendor.</p> <p>IX. Any of the declarations furnished by the contractor at the time of bidding and/ or entering into the contract for supply are found untruthful and such declarations were of a nature that could have resulted in non-award of contract to the contractor or could expose BHEL and/ or Owner to adverse consequences, financial or otherwise.</p> <p>X. Supplier/Vendor is convicted of any offence involving corrupt business practices, antinational activities or any such offence that compromises the business ethics of BHEL, in violation of the Integrity Pact entered into with BHEL has the potential to harm the overall business of BHEL/ Owner.</p> <p>Note-Once BHEL considers that a breach of contract has occurred on the part of Supplier/Vendor, BHEL shall notify the Supplier/Vendor by way of notice in this regard. Contractor shall be given an opportunity to rectify the reasons causing the breach of contract within a period of 14 days.</p> <p>In case the contractor fails to remedy the breach, as mentioned in the notice, to the satisfaction of BHEL, BHEL shall have the right to take recourse to any of the remedial actions available to it under the relevant provisions of contract.</p> <p>Remedies in case of Breach of Contract.</p> <p>i) Wherein the period as stipulated in the notice issued under above clause has expired and Supplier/Vendor has failed to remedy the breach, BHEL will have the right to terminate the contract on the ground of "Breach of Contract" without any further notice to contractor.</p> <p>ii) Upon termination of contract, BHEL shall be entitled to recover an amount equivalent to 10% of the Contract Value for the damages on account of breach of contract committed by the Supplier/Vendor. This amount shall be recovered by way of encashing the security instruments like performance bank guarantee etc available with BHEL against the said contract. In case the value of the security instruments available is less than 10% of the contract value, the balance amount shall be recovered from other financial remedies (i.e. available bills of the Supplier/Vendor, retention amount, from the money due to the Supplier/Vendor etc. with BHEL) or the other legal remedies shall be pursued.</p> <p>iii) wherever the value of security instruments like performance bank guarantee available with BHEL against the said contract is 10% of the contract value or more, such security instruments to the extent of 10% contract value will be encashed. In case no security instruments are available or the value of the security instruments available is less than 10% of the contract value, the 10% of the contract value or the balance amount, as the case may be, will be recovered in all or any of the following manners:</p> <p>iv) In case the amount recovered under sub clause (a) above is not sufficient to fulfil the amount recoverable then; a demand notice to deposit the balance amount within 30 days shall be issued to Supplier/Vendor.</p> <p>v) If Supplier/Vendor fails to deposit the balance amount within the period as prescribed in</p>	

		<p>demand notice, following action shall be taken for recovery of the balance amount:</p> <p>a) from dues available in the form of Bills payable to defaulted Supplier/Vendor against the same contract.</p> <p>b) If it is not possible to recover the dues available from the same contract or dues are insufficient to meet the recoverable amount, balance amount shall be recovered from any money(s) payable to Supplier/Vendor under any contract with other Units of BHEL including recovery from security deposits or any other deposit available in the form of security instruments of any kind against Security deposit or EMD.</p> <p>vi) In-case recoveries are not possible with any of the above available options, Legal action shall be initiated for recovery against defaulted supplier/Vendor.</p> <p>vii) It is an agreed term of contract that this amount shall be a genuine pre-estimate of damages that BHEL would incur in completion of balance contractual obligation of the contract through any other agency and BHEL will not be required to furnish any other evidence to the Supplier/Vendor for the purpose of estimation of damages.</p> <p>viii) In addition to the above, imposition of liquidated damages, debarment, termination, de-scoping, short-closure, etc., shall be applied as per provisions of the contract.</p> <p>Note:</p> <p>1) The defaulting Supplier/Vendor shall not be eligible for participation in any of the future enquiries floated by BHEL to complete the balance work. The defaulting contractor shall mean and include:</p> <p>(a) In case defaulted Supplier/Vendor is the Sole Proprietorship Firm, any Sole Proprietorship Firm owned by same Sole Proprietor.</p> <p>(b) In case defaulted Supplier/Vendor is The Partnership Firm, any firm comprising of same partners/ some of the same partners ; or sole proprietorship firm owned by any partner(s) as a sole proprietor.</p>	
21.	Suspension of Business Dealings with Suppliers / Contractors:	<p>The offers of the bidders who are under suspension as also the offers of the bidders, who engage the services of the banned firms / principal / agents, shall be rejected. The list of banned firms is available on BHEL web site www.bhel.com.</p> <p>If any bidder / supplier / contractor during pre-tendering / tendering / post tendering / award / execution / post-execution stage indulges in any act, including but not limited to, mal-practices, cheating, bribery, fraud or and other misconduct or formation of cartel so as to influence the bidding process or influence the price or tampers the tendering process or acts or omits in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860(Bhartiya Nyaya Samhita 2023) or any other law in force in India, or does anything which is actionable under the Guidelines for Suspension of Business dealings, action may be taken against such bidder / supplier / contractor as per extant guidelines of the company available on www.bhel.com and / or under applicable legal provisions. Guidelines for suspension of business dealings is available in the webpage: http://www.bhel.com/vender_registration/vender.php.</p>	
22.	Settlement of Dispute, CONCILIATION & ARBITRATION:	<p>Settlement of Dispute</p> <p>If any dispute or difference of any kind whatsoever shall arise between BHEL and the Supplier/Vendor, arising out of the contract for the performance of the work whether during the progress of contract termination, abandonment or breach of the contract, it shall in the first place referred to Designated Officer / IEM for amicable resolution by the parties. Designated Officer / IEM who within 60 days after being requested shall give written notice of his decision to the contractor. Save as hereinafter provided, such decision in respect of every matter so referred shall forthwith be given effect to by the Supplier/Vendor who shall proceed with the work with all due diligence, whether he or BHEL desires to resolve the dispute as hereinafter provided or not. If after the Designated Engineer has given written notice of this decision to the party and no intention to pursue the dispute has been communicated to him by the affected party within 30 days from the receipt of such notice, the said decision shall become final and binding on the parties. In the event the Supplier/Vendor being dissatisfied with any such decision or if amicable settlement cannot be reached then all such disputed issues shall be resolved through conciliation in terms of the BHEL Conciliation Scheme 2018 as per 'CONCILIATION' Clause.</p> <p>CONCILIATION:</p> <p>Any dispute, difference or controversy of whatever nature howsoever arising under or out of or in relation to this Agreement (including its interpretation) between the Parties, and so notified in writing by either Party to the other Party (the "Dispute") shall, in the first instance, be attempted to be resolved amicably in accordance with the conciliation procedure as per BHEL Conciliation Scheme 2018. The proceedings of Conciliation shall broadly be governed by Part-III</p>	

		<p>of the Arbitration and Conciliation Act 1996 or any statutory modification thereof and as provided in - "Procedure for conduct of conciliation proceedings" (as available in www.bhel.com).</p> <p>ARBITRATION:</p> <p>Except as provided elsewhere in this Contract, in case Parties are unable to reach amicable settlement (whether by Conciliation to be conducted as provided herein above or otherwise) in respect of any dispute 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 (hereinafter referred to as the 'Dispute'), then, either Party may, refer the disputes to Arbitral Institution and such dispute to be adjudicated by Sole Arbitrator appointed in accordance with the Rules of said Arbitral Institution.</p> <p>A party willing to commence arbitration proceeding shall invoke Arbitration Clause by giving notice to the other party in terms of section 21 of the Arbitration & Conciliation Act, 1996 (hereinafter referred to as the 'Notice') before referring the matter to arbitral institution. The Notice shall be addressed to the Head of the Region, Power Sector/ Unit, BHEL, executing the Contract and shall contain the particulars of all claims to be referred to arbitration with sufficient detail and shall also indicate the monetary amount of such claim including interest, if any.</p> <p>After expiry of 30 days from the date of receipt of aforesaid notice, the party invoking the Arbitration shall submit that dispute to the Arbitral Institutions (shall be identified by the contract issuing agency) and that dispute shall be adjudicated in accordance with their respective Arbitration Rules. The matter shall be adjudicated by a Sole Arbitrator who shall necessarily be a Retd Judge having considerable experience in commercial matters to be appointed/nominated by the respective institution. The cost/expenses pertaining to the said Arbitration shall also be governed in accordance with the Rules of the respective Arbitral Institution. The decision of the party invoking the Arbitration for reference of dispute to a specific Arbitral institution for adjudication of that dispute shall be final and binding on both the parties and shall not be subject to any change thereafter. The institution once selected at the time of invocation of dispute shall remain unchanged.</p> <p>The fee and expenses shall be borne by the parties as per the Arbitral Institutional rules.</p> <p>The Arbitration proceedings shall be in English language and the seat and venue of Arbitration shall be at the court(s) of Haridwar.</p> <p>Subject to the above, the provisions of Arbitration & Conciliation Act 1996 and any amendment thereof shall be applicable. All matters relating to this Contract and arising out of invocation of Arbitration clause are subject to the exclusive jurisdiction of the Court(s) situated at Haridwar , shall have exclusive jurisdiction.</p> <p>Notwithstanding any reference to the Designated Engineer or Conciliation or Arbitration herein, a. the parties shall continue to perform their respective obligations under the Contract unless they otherwise agree. Settlement of Dispute clause cannot be invoked by the Contractor, if the Contract has been mutually closed or 'No Demand Certificate' has been furnished by the Contractor or any Settlement Agreement has been signed between the Employer and the Contractor.</p> <p>It is agreed that Mechanism of resolution of disputes through arbitration shall be available only in the cases where the value of the dispute is less than Rs. 10 Crores.</p> <p>In case the disputed amount Claim, Counter claim including interest is Rs. 10 crores and above, the parties shall be within their rights to take recourse to remedies other than Arbitration, as may be available to them under the applicable laws after prior intimation to the other party. Subject to the aforesaid conditions, provisions of the Arbitration and Conciliation Act, 1996 and any statutory modifications or re-enactment thereof as amended from time to time, shall apply to the arbitration proceedings under this clause.</p> <p>In case, multiple arbitrations are invoked (whether sub-judice or arbitral award passed) by any party to under this contract, then the cumulative value of claims (including interest claimed or awarded) in all such arbitrations shall be taken in account while arriving at the total claim in dispute for the subject contract for the purpose of clause mentioned above. Disputes having cumulative value of less than 10 crores shall be resolved through arbitration and any additional</p>	
--	--	---	--

		dispute shall be adjudicated by the court of competent jurisdiction.													
23.	Action against Bidders / vendor / supplier / contractor in case of default:	<p>In order to protect the commercial interests of BHEL, BHEL shall take action against supplies / contractors by way of suspension of business dealings, who either fail to perform or are in default without any reasonable cause, cause loss of business/ money/ reputation, indulge in malpractices, cheating, bribery, fraud or any other misconduct or formation of cartels so as to influence the bidding process or influence the price etc.</p> <p>Suspension of Business Dealings could be in the form of “Hold” or “Banning” a supplier/ contractor or a bidder and shall be as per “Guidelines for Suspension of Business Dealings with Suppliers/ Contractors” available at BHEL’s website “https://www.bhel.com/guidelines-suspension-business-dealings-supplierscontractors”</p>													
24.	MICRO AND SMALL ENTERPRISES (MSE):	<p>Any Bidder falling under MSE category shall furnish the following details & submit documentary evidence/ Govt. Certificate etc. in support of the same along with their techno-commercial offer.</p> <table border="1"> <tr> <th>Type under MSE</th><th>SC/ST owned</th><th>Women owned</th><th>Others (excluding SC/ ST & Women Owned)</th></tr> <tr> <td>Micro</td><td></td><td></td><td></td></tr> <tr> <td>Small</td><td></td><td></td><td></td></tr> </table> <p>Note: If the bidder does not furnish the above, offer shall be processed construing that the bidder is not falling under MSE category.</p> <p>a) MSE suppliers can avail the intended benefits in respect of the procurements related to the Goods and Services only (Definition of Goods and Services as enumerated by Govt. of India vide Office Memorandum F. No. 21(8)/2011-MA dtd. 09/11/2016 office of AS & DC, MSME) only if they submit along with the offer, attested copies of either Udyam Registration. Date to be reckoned for determining the deemed validity will be the last date of Technical Bid submission. Non-submission of supporting document in GeM portal will lead to consideration of their bids at par with other bidders. No benefits shall be applicable for this enquiry if the above required documents are not uploaded at the time of bid submission. Documents submitted by the bidder shall be verified by BHEL for rendering the applicable benefits.</p>	Type under MSE	SC/ST owned	Women owned	Others (excluding SC/ ST & Women Owned)	Micro				Small				
Type under MSE	SC/ST owned	Women owned	Others (excluding SC/ ST & Women Owned)												
Micro															
Small															
25.	JURISDICTION:	This contract shall be governed by the Law for the time being in force in the Republic of India. Subject to clause(s) mentioned above of this contract, the Civil Court having original Civil Jurisdiction at Haridwar shall alone have exclusive jurisdiction in regard to all matters in respect of the Contract.													
26.	Force Majeure	<p>"Force Majeure" shall mean circumstance which is: a) beyond control of either of the parties to contract, b) either of the parties could not reasonably have provided against the event before entering into the contract, c) having arisen, either of the parties could not reasonably have avoided or overcome, and d) is not substantially attributable to either of the parties And Prevents the performance of the contract, Such circumstances include but shall not be limited to: i) War, hostilities , invasion, act of foreign enemies. ii) Rebellion, terrorism, revolution, insurrection, military or usurped power, or civil war. iii) Riot, commotion or disorder by persons other than the contractor’s personnel and other employees of the contractor and sub-contractors. iv) Strike or lockout not solely involving the contractor’s personnel and other employees of the contractor and sub-contractors. v) Encountering munitions of war, explosive materials, ionizing radiation or contamination by radio-activity, except as may be attributable to the contractor’s use of such munitions, explosives, radiation or radio- activity. vi) Natural catastrophes such as earthquake, tsunami, volcanic activity, hurricane or typhoon, flood, fire, cyclones etc. vii) Epidemic, pandemic etc.</p> <p>The following events are explicitly excluded from Force Majeure and are solely the responsibilities of the non-performing party: a) any strike, work-to-rule action, goslow or similar labour difficulty (b) late delivery of equipment or material (unless caused by Force Majeure event) and (c) economic hardship.</p> <p>If either party is prevented, hindered or delayed from or in performing any of its obligations under the Contract by an event of Force Majeure, then it shall notify the other in writing of the occurrence of such event and the circumstances thereof within 15 (fifteen) days after the occurrence of such event.</p>													

		<p>The party who has given such notice shall be excused from the performance or punctual performance of its obligations under the Contract for so long as the relevant event of Force Majeure continues and to the extent that such party's performance is prevented, hindered or delayed. The Time for Completion shall be extended by a period of time equal to period of delay caused due to such Force Majeure event.</p> <p>Delay or non-performance by either party hereto caused by the occurrence of any event of Force Majeure shall not</p> <p>i) Constitute a default or breach of the Contract. ii) Give rise to any claim for damages or additional cost expense occasioned thereby, if and to the extent that such delay or non-performance is caused by the occurrence of an event of Force Majeure.</p> <p>BHEL at its discretion may consider short closure of contract after 1 year of imposition of Force Majeure in line with extant guidelines. In any case, Supplier/Vendor cannot consider deemed short-closure after 1 year of imposition of Force Majeure</p>	
27.	Cartel Formation	<p>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.</p>	
28.	Order of Precedence:	<p>In the event of any ambiguity or conflict between the Tender Documents, the order of precedence shall be in the order below:</p> <ol style="list-style-type: none"> Amendments/Clarifications/Corrigenda/Errata etc. issued in respect of the tender documents by BHEL. Buyer Added Bid Specific ATC GeM Bid Technical Conditions of Contract (TCC) GeM GTC 	
29.	Conflict of interest:	<p>A bidder shall not have conflict of interest with other bidders. Such conflict of interest can lead to anti-competitive practices to the detriment of Procuring Entity's interests. The bidder found to have a conflict of interest shall be disqualified. A bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if:</p> <ol style="list-style-type: none"> they have controlling partner (s) in common; or they receive or have received any direct or indirect subsidy/financial stake from any of them; or they have the same legal representative/agent for purposes of this bid; or they have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder; or Bidder participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ sub-assembly/ Assemblies from one bidding manufacturer in more than one bid; or In cases of agents quoting in offshore procurements, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. One manufacturer can also authorize only one agent/dealer. There can be only one bid from the following: 1. The principal manufacturer directly or through one Indian agent on his behalf; and 2. Indian/foreign agent on behalf of only one principal or A Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid or In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidders must proactively declare such sister/ common business/ management units in same/ similar line of business. 	
30.	Guarantee/Warranty clause	<p>Kindly confirm that Guarantee/Warranty shall be provided for a period of "18 months from the date of dispatch". In case of any failure or trouble reported from site, the supplier should depute their representative immediately to attend the problem and replace the defective component/part if required, without any additional cost to BHEL.</p> <p>Supplier shall be responsible for free replacement of defective equipment / material at our site</p>	

		Deviation in Guarantee clause is not acceptable & BHEL reserve the rights to reject the offer of bidder/s offering deviation in Guarantee clause.	
31.	Order Acceptance:	Ink signed order acceptance shall be furnished within 15 days of order placement. In case, order acceptance do not received within 15 days of order placement, PO deemed to be accepted by you.	
32.	Dispatch documents	Following dispatch documents to be provided immediately after directly dispatch to BHEL Project site for billing purpose: <ul style="list-style-type: none"> • Guarantee/Warranty Certificates • E- Invoice and commercial invoice • GeM invoice • Original consignee copies of GR/LR/RR (Material shall be dispatched on door delivery basis without consignee copy) • Packing list • Original GST compliance certificate • E-way bill • MRC/POD/Receipted LR/RR/GR copy (as per proof of delivery of material at BHEL Project site) 	
33.	Additional Conditions for Assessment	BHEL reserves the right to consider / Not-consider the offers based on the evaluation of documents submitted for the Pre-Qualification Criteria (PQR).	
		BHEL also reserves the right to have on-site assessment of the facilities at supplier's works during the bid evaluation.	
34.	Quality Requirement	VENDOR TO CONFIRM FOR PROVIDING TESTING AND CERTIFICATION AS PER ORDER SPECIFICATION	

SPECIAL NOTE FOR BIDDERS:

- In the event of our customer order covering this tender being cancelled /placed on hold /otherwise modified, BHEL would be constrained to accordingly cancel / hold / modify the tender at any stage of execution.
- BHEL may negotiate the L1 rate, if not meeting our budget / estimated cost. BHEL may re-float the tender opened, if L1 price is not acceptable to BHEL even after negotiation.
- Any change in applicable rates of Tax or any other statutory levies (Direct / Indirect) or any new introduction of any levy by means of statute and its corresponding liability for the deliveries beyond the agreed delivery date for reasons not attributable to BHEL will be to vendors account. BHEL will not reimburse the same and any subsequent claim in this respect will be summarily rejected.
- BHEL reserves its right to reject an offer due to unsatisfactory past performance by the respective Vendor in the execution of any contract to any BHEL project / Unit.
- The offers of the bidders who are under suspension and also the offers of the bidders, who engage the services of the banned firms /principal/agents, shall be rejected. The list of banned firms is available on BHEL web site www.bhel.com.
- Recovery / deduction as applicable as per Direct and Indirect taxes as notified by Govt. Of India from time to time will be made and information/certificate for such deduction/recoveries shall be provided by BHEL to the vendor.
- If the delivery of supply as detailed above gets delayed beyond the delivery period, the Supplier/Vendor shall request for a delivery extension and BHEL at its discretion may extend the Contract. However, if any 'Delivery extension' is granted to the Supplier/Vendor for completion of supply, due to backlog attributable to the Supplier/Vendor, then it shall be without prejudice to the rights of BHEL to impose LD for the delays attributable to the Supplier/Vendor.
- In case BHEL increase the quantity during currency of the contract in line with quantity variation clause of GeM bid, delivery extension on pro-rata basis shall be given for supply of these additional quantity.

Following documents are an integral part of this Tender Enquiry and endorsed copies of these documents (duly signed and stamped on each page, as a token of acceptance) are to be submitted/uploaded along with offer on GeM portal against this bid.

- Please submit replica of Price schedule (without prices) showing "quoted" in place of price along with techno-commercial bid (Part-I).
- Please submit signed & Stamped copy (each page) of duly filled of confirmation column of "Buyers Specific Additional Terms & Conditions (ATC)" and its clause wise supporting documents where required.
- Please submit signed & stamped copy (each page) for qualifying PQR with proper filled information and related supporting documents as mentioned in PQR.
- Please submit certificate of Minimum local content as specified in the Make In India Certificate of the tender

APPLICABLE MANDATORY SPARE LIST FOR LUB OIL PURIFICATION UNIT

DRAWING NO-41810F51002 REV 00

Mat code-W90318103630

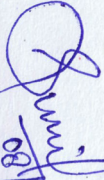
PROJECT- 1 X 660 MW PANKI

WO: 10856W55402

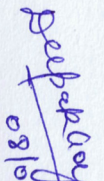
SNO	ITEM DESC	QTY	UOM	Make	Model	Additional Description	Remarks
1	AUX CONTACT SET	12	SET	Schneider Electric	LAD-N20	2 NO	
2	FIXED CONTACT & MOVING CONTACT MAIN CONTACT KIT SET	6	SET	Suitable for Contact			
3	CURRENT TRANSFORMER (METERING)	3	NO	newtek	150A,5A, NE310S	150A/5A, 3.75VA, CL:1	
4	CONTROL SUPPLY TRANSFORMER	1	SET	Yasho/Supercoil/Transfield	415V/110V,200VA		
5	AMMETER	1	SET	Rishabh	0-25/150A,direct,96x96		
6	POWER CONTACTORS 1NO+1NC	5	NO	Schneider Electric	LC1-D25-F7 (1 No.) LC1-D40-F5 (2 No.) LC1-D25-F7 (1 No.) LC1-D12-F7 (1 No.)	AC3-25A,AC1-40A,Coil-110V-50/60Hz AC3-40A,AC1-60A,Coil-110V-50Hz AC3-25A,AC1-40A,Coil-	

				110V-50/60Hz AC3-12A, AC1-25A, Coil- 110V-50/60Hz	
7	CONTROL AND SELECTOR SWITCHES	1	SET	Teknic 2AK2-2PB+S1+S2 2AS2-2P + S1 +S2	1NO+1NC, 22.5mm 1NO + 1NC, Dia 22.5 mm
8	THERMAL BIMETAL RELAYS	6	NO	REPUTED MAKE	
9	DOOR LIMIT SWITCHES	6	NO	REPUTED MAKE	

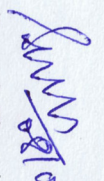
NOTE-DRAWING SHOULD BE READ ALONGWITH THE SPECIAL INSTRUCTIONS MENTIONED IN THE INDENT.


08/05/25
(Sunil Kumar Gautam)

Dy. Manager


08/05/25
(Deepak Goyal)

Sr. Manager


08/05/25
(Suresh Chandra)

Sr. DGM

APPLICABLE MANDATORY SPARE LIST FOR LUB OIL PURIFICATION UNIT

DRAWING NO-41810F61009 REV 00

Mat code-W90318036010

PROJECT- 2 X 660 MW UDANGUDI

WO: 10848U11502

SNO	ITEM DESC	QTY	UOM	Make	Model	Additional Description	Remarks
1	AUXILIARY CONTACT SET	5	No.	Schneider Electric	LAD-N20	2 NO	

NOTE-DRAWING SHOULD BE READ ALONGWITH THE SPECIAL INSTRUCTIONS MENTIONED IN THE INDENT.

(Sunil Kumar Gautam)

Dy. Manager

(Deepak Goyal)

Sr. Manager

(Suresh Chandra)

Sr. DGM

PRE-QUALIFICATION REQUIREMENTS FOR SPARES OF LT SWITCHGEAR ITEMS FOR OPU


1. Vendor to submit experience-list^s (manufacturing/supplying/ testing/ support after sales) for supply of any of the 3 items listed in the Doc. No. 41810F51002 of enquiry for continuous operation as per details outlined below:-

\$ where experience list means fulfillment of below parameters: -

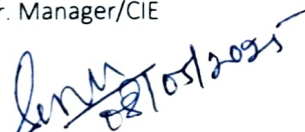
- a) Supply of at least 2 no. each of any of the 3 items listed in the Doc. No. 41810F51002 of enquiry in last 5 (Five) years from the date of Enquiry.
- b) Further details of experience-list to be furnished in the following tabular format: -

Sl No.	Project/Customer Name & Location	Purchase Order Reference No.	Date of referred Purchase Order	Details of items supplied	Contact Details of End-Customer (Name, Full Address, Phone, Email etc.)

2. Vendor to submit unpriced copy of Purchase Orders in support of clause 1 (a) above.
3. BHEL reserve the right to verify the information submitted by bidder. In case the information found to be false /incorrect, the offer shall be rejected. Bidder to confirm.


 Sunil Kumar Gautam
 Dy. Manager/CIE



 Sh. Deepak Goyal
 Sr. Manager/CIE



 Sh. Suresh Chandra
 SDGM/CIE


MANUFACTURER'S NAME AND ADDRESS			QUALITY PLAN				TO BE FILLED BY BHEL		TO BE FILLED BY BHEL			
BHEL	VENDOR'S NAME	ITEM			QP NO.							
					REV							
		DRG. NO.	AS PER PO									
		SPEC.	AS PER PO									
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY			REMARKS
1	2	3	4	5	6	7	8	9	D	10		11

Note: All page of inspection documents shall be numbered in chronology with the QAP clause , dully mentioning the corresponding QAP clause nos. at the top of each page. One index page containing the documents descriptions, their page no & QAP clause shall be attached upfront the inspection documents.


MANUFACTURER/SUBCONTRACTOR		LEGEND:	FOR CUSTOMER USE	
		! RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION.		APPROVED BY
		M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER		


दिनांक एवं हस्ताक्षर SIGN & DATE			उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013																																																												
भावकी पूरी योजना को अधिकृत करार है	SUPERSEDES INVENTORY NO	पृष्ठ 40 का 1 Page 1 of 40																																																														
<h2 style="margin: 0;">Bid Specification</h2> <h3 style="margin: 0;">For</h3> <h2 style="margin: 0;">Turbine Oil Purification System</h2> <h3 style="margin: 0;">(Centrifuge type)</h3>																																																																
<p>Copyright and Confidential The information on this documents is the property of Bharat Heavy Electrical Limited It must not be used directly or indirectly in any way detrimental to the interest of the company</p>																																																																
<p>स्वायत्तकार एवं गोपनीय इस प्रयोग में ही गई योजना भारत हीवी इलेक्ट्रिकल लिमिटेड की सम्पत्ति है इसका प्रयोग एवं प्रकाशक कर में किसी भी तरह प्रयोग को बिना भारती के लिख में इतिहासक हों न किया जाए।</p>																																																																
दिनांक एवं हस्ताक्षर SIGN & DATE	भावकी पूरी योजना INVENTORY NO	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:15%;"></td> <td style="width:15%;"></td> <td style="width:15%;"></td> <td style="width:15%;"></td> <td style="width:15%; text-align: center;">नाम NAME</td> <td style="width:20%; text-align: center;">दिनांक एवं हस्ताक्षर SIGNATURE & DATE</td> </tr> <tr> <td>CIE</td> <td>B. S. Rana</td> <td><i>[Signature]</i> 18/03/16</td> <td>अनुवादक</td> <td>TRANSLATED BY</td> <td></td> </tr> <tr> <td>QAX</td> <td>S. K. Chauhan</td> <td><i>[Signature]</i></td> <td>निर्वाहकर्ता</td> <td>WORKED BY</td> <td>Anil Kumar 18.03.16</td> </tr> <tr> <td>TSX</td> <td>DEEPAK</td> <td><i>[Signature]</i></td> <td>जांचकर्ता</td> <td>CHECKED BY</td> <td>A. S. Rajput 18.03.16</td> </tr> <tr> <td>सहमत विभाग AGREED DEPTT</td> <td>नाम NAME</td> <td>दिनांक एवं हस्ताक्षर DATE & SIGNATURE</td> <td>पर्यवेक्षणकर्ता</td> <td>SUPERVISED BY</td> <td>R. Panja 18-03-16</td> </tr> <tr> <td>Worked By</td> <td>Anil Kumar</td> <td><i>[Signature]</i> 18/03/2022</td> <td>स्वीकृति</td> <td>APPROVED : S. K. Baveja</td> <td><i>[Signature]</i> 18.3.16</td> </tr> <tr> <td>Checked By</td> <td>S.K. Sonkar</td> <td><i>[Signature]</i> 17/05/2022</td> <td>निर्माण</td> <td>PREPARED : PED</td> <td>Gr. NO. 8.20</td> </tr> <tr> <td>REV. NO.</td> <td>08</td> <td></td> <td>हारी</td> <td>ISSUED : TSX</td> <td>दिनांक DATE : 25.8.84</td> </tr> <tr> <td>DI</td> <td>29.03.16</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CHANGE ADVICE NO.</td> <td>STE-22-18</td> <td>Reaffirmed Year 2022</td> <td></td> <td></td> <td></td> </tr> </table>							नाम NAME	दिनांक एवं हस्ताक्षर SIGNATURE & DATE	CIE	B. S. Rana	<i>[Signature]</i> 18/03/16	अनुवादक	TRANSLATED BY		QAX	S. K. Chauhan	<i>[Signature]</i>	निर्वाहकर्ता	WORKED BY	Anil Kumar 18.03.16	TSX	DEEPAK	<i>[Signature]</i>	जांचकर्ता	CHECKED BY	A. S. Rajput 18.03.16	सहमत विभाग AGREED DEPTT	नाम NAME	दिनांक एवं हस्ताक्षर DATE & SIGNATURE	पर्यवेक्षणकर्ता	SUPERVISED BY	R. Panja 18-03-16	Worked By	Anil Kumar	<i>[Signature]</i> 18/03/2022	स्वीकृति	APPROVED : S. K. Baveja	<i>[Signature]</i> 18.3.16	Checked By	S.K. Sonkar	<i>[Signature]</i> 17/05/2022	निर्माण	PREPARED : PED	Gr. NO. 8.20	REV. NO.	08		हारी	ISSUED : TSX	दिनांक DATE : 25.8.84	DI	29.03.16					CHANGE ADVICE NO.	STE-22-18	Reaffirmed Year 2022			
				नाम NAME	दिनांक एवं हस्ताक्षर SIGNATURE & DATE																																																											
CIE	B. S. Rana	<i>[Signature]</i> 18/03/16	अनुवादक	TRANSLATED BY																																																												
QAX	S. K. Chauhan	<i>[Signature]</i>	निर्वाहकर्ता	WORKED BY	Anil Kumar 18.03.16																																																											
TSX	DEEPAK	<i>[Signature]</i>	जांचकर्ता	CHECKED BY	A. S. Rajput 18.03.16																																																											
सहमत विभाग AGREED DEPTT	नाम NAME	दिनांक एवं हस्ताक्षर DATE & SIGNATURE	पर्यवेक्षणकर्ता	SUPERVISED BY	R. Panja 18-03-16																																																											
Worked By	Anil Kumar	<i>[Signature]</i> 18/03/2022	स्वीकृति	APPROVED : S. K. Baveja	<i>[Signature]</i> 18.3.16																																																											
Checked By	S.K. Sonkar	<i>[Signature]</i> 17/05/2022	निर्माण	PREPARED : PED	Gr. NO. 8.20																																																											
REV. NO.	08		हारी	ISSUED : TSX	दिनांक DATE : 25.8.84																																																											
DI	29.03.16																																																															
CHANGE ADVICE NO.	STE-22-18	Reaffirmed Year 2022																																																														

दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013	
			पृष्ठ 40 का 2	
			Page 2 of 40	
SUPERSEDES INVENTORY NO	LIST OF CONTENTS:			
भारतीय मूल की संपत्ति को अधिकृत करना है				
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited It must not be used directly or indirectly in any way detrimental to the interest of the company	1) INTENT OF SPECIFICATION 3			
	2) SCOPE OF SUPPLY 3			
	3) GENERAL TECHNICAL REQUIREMENTS 4			
	4) CONTROL & INSTRUMENTATION 6			
	5) PERFORMANCE REQUIREMENTS 10			
	6) GUARANTEES 10			
	7) QUALITY ASSURANCE, INSPECTION AND TESTING 11			
	8) DOCUMENTS, DATA AND DRAWINGS TO BE FURNISHED BY SUPPLIER 13			
	9) MATERIALS OF CONSTRUCTION 15			
	10) CODES AND STANDARDS 15			
	11) CLEANING, PROTECTION AND PAINTING 15			
	12) DESIGN CO-ORDINATION MEETING 16			
	13) LIST OF CROSS-REFERRED STANDARDS 16			
	14) ANNEXURE- I (PROPERTIES OF TURBINE OIL) 18			
	15) ANNEXURE- II (DATA SHEET OF TURBINE OIL SYSTEM) 20			
	16) ANNEXURE- III (SPECIFICATION OF MOTOR) 30			
	17) ANNEXURE- IV (SPECIFICATION OF INSTRUMENTS) 33			
	18) ANNEXURE- V (P&ID) 34			
	19) ANNEXURE- VI (QUALITY PLAN) 35			
	20) ANNEXURE- VII (CHECK LIST) 36			
दिनांक एवं हस्ताक्षर SIGN & DATE भारतीय मूल की संपत्ति INVENTORY NO	Rev. no. 08	निर्माणकर्ता WORKED BY:	Anil / Kavita	18.03.16
भारतीय मूल की संपत्ति INVENTORY NO		जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh	18.03.16

SIGN & DATE 18/03/16		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013	
			पृष्ठ 40 का 3 Page 3 of 40	
SUPERSEDES INVENTORY NO 55338	1 INTENT OF SPECIFICATION This specification is intended to cover design, manufacturing, testing, delivery supervision of system & commissioning of turbine oil purification system and putting the system into satisfactory operation. <u>RESPONSIBILITY OF BIDDER:</u> The bidder shall be responsible for providing all material, equipment and services, specified or otherwise which are required to complete the project and fulfill the intent of ensuring operability, maintainability and the reliability of the complete work covered under this specification. It is not the intent to specify completely here in, all aspects of design and construction of equipment. Nevertheless, the equipment shall conform in all respects to high standards of engineering, design & workmanship & shall be capable of performing in continuous commercial operation, in a manner acceptable to Purchaser/Owner. Bidder is requested to carefully examine and understand the specification & seek clarification, if required, to ensure that they have understood the specifications prior to submit the bid.			
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.	2 SCOPE OF SUPPLY 2.1 One oil purification system (OPS) shall comprise of: <ul style="list-style-type: none"> a. One centrifuge along with its drive & accessories. b. Indirect type oil heater and accessories c. One dirty oil feed pump complete with its drive & accessories. d. One clean oil discharge pump complete with its drive & accessories (if applicable). e. Polishing filter with suitable bypass arrangement. f. Adequately sized booster pump (if required). g. One overflow sight fitting (loose supply). h. The OPS shall be such that it can be used both as purifier as well as clarifier. i. An arrangement to detect and raise alarm in case of liquid seal breakage. j. All relevant valves, Y-type strainer, fittings and inter-connecting piping. k. All flanged end valves and flanged terminal points of piping along with counter flanges, nuts, bolts and gaskets. 			
SIGN & DATE 18/03/16	Rev. no. 08	निर्माणकर्ता WORKED BY:	Anil / Kavita	Anil Kumar Kavita 18.03.16
INVENTORY NO 55338		जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh	Rajput Devesh 18.03.16

<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भारत एवं हरियाणा SIGN & DATE</div>		<div>भार</div>	
---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	----------------	--

BHEL भारतीय भारती SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013	
			पृष्ठ 40 का 5 Page 5 of 40	
SUPERSEDES INVENTORY NO. भारतीय भारती अधिकारि संख्या है	COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company	3.9 The OPS shall be equipped with sight glasses both for the purified oil and the separated water from the collecting pan.		
		3.10 Each purifier system shall be furnished with a positive displacement feed pump & a similar type discharge pump, if needed. Each pump shall be of the helical, herringbone, Spur gear or screw type with a normal capacity of at least 10% greater than that of the purifier system when operating under the maximum suction lift against the pressure required to feed the centrifuge. Each pump shall be fitted with adequate relief bypass valve to prevent damage from excess pressure.		
		3.11 Although oil temperature at the inlet to heater during normal operation of Turbine Generator set shall be 65°C but system should be designed to operate with oil at 20°C during cold starting of TG-set. During such operation, even if guaranteed purification cannot be achieved, the system shall be accepted.		
		3.12 Arrangement of oil recirculation piping/piping connection should be provided with recirculation line connecting to clean oil line at oil purifier outlet (with applicable NRVs) such that there are only two interfaces of oil inlet & outlet connection to oil purifier.		
		3.13 For two or more centrifuges running in parallel, a common skid housing for both or multiple centrifuges shall be supplied with inlet & outlet manifold. Connection interface with BHEL shall be inlet & outlet only, not multiple connections.		
		3.14 Pressure at the outlet of oil purification system shall be 1.5 to 2.0 bar (gauge).		
		3.15 The inlet, outlet & overflow connections to overflow sight fitting shall be NB80 (ø88.9X3.96)/NB40 (ø48.3X3.96)/NB15 (ø21.3X2.6) respectively. Also, it is to be noted that overflow sight fitting is to be supplied loose and the same shall be fitted in BHEL's Main Oil Tank at site.		
		3.16 A common drive system for separator, dirty oil feed pump and clean oil discharge pump (if required) shall also be considered. Details of such drive should be clearly submitted by the vendor in his offer.		
		3.17 Different variants for combination of Flow capacity of Oil Purification System, Control Panel Type and Heater Rating are given below in Table- A.		
भारतीय भारती INVENTORY NO. भारतीय भारती	Rev. no. 08	निर्माणकर्ता WORKED BY:	Anil / Kavita	18.03.16
भारतीय भारती INVENTORY NO. भारतीय भारती		जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh	18.03.16

दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013
			पृष्ठ 40 का 6
			Page 6 of 40


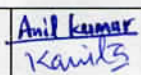
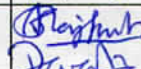
SUPERSEDES INVENTORY NO.	आगामी पूर्ण सूची में परिवर्तित करना है	TABLE- A


Var. No.	Flow capacity of purification system (Litre Per Hour)	Control Panel Type	Heater Rating (kW)
1.	7500	DCS	90 kW
2.	6000	DCS	72 kW
3.	2 x 4500	DCS	120 kW
4.	7500	Relay	90 kW
5.	6000	Relay	72 kW
6.	2 x 4500	Relay	120 kW
7.	7500	DCS	55 kW
8.	6000	DCS	45 kW
9.	2 x 4500	DCS	80 kW
10.	7500	Relay	55 kW
11.	6000	Relay	45 kW
12.	2 x 4500	Relay	80 kW


4 CONTROL AND INSTRUMENTATION


4.1 Offer should include all necessary interlocks & instruments along with remote indication facility in the control panel (protection type). Purchaser will review same & necessary addition / subtraction in interlocks & instruments, considered essential for smooth operation of the unit, will be asked to include. Some of the important interlocks/controls, required, are given below.


- Separator shall be provided with interlocks to prevent the operation of the unit unless the feed pump & the discharge pump are operating.
- A system of annunciating the flooding of the separator due to loss of water seal shall be provided.
- All instruments i.e. pressure gauges, RTDs etc. should be reliable & of proven design. Purchaser has full right to ask them changed from one supply source to another according to operational experience. All instruments should be calibrated at minimum 5 points throughout the range and accuracy, hysteresis, repeatability etc. shall be within the specified limits i.e. $\pm 1\%$.
- Auxiliary electric supply available at site comprises of 415V, 3 ϕ , 3 wires, 50 Hz ($\pm 10\%$ V, $\pm 5\%$ frequency, $\pm 10\%$ combined). If supplier requires any other supply for his devices, instruments and drives etc. he shall arrange \ to convert 415V, 3 ϕ supply to the required value for further distribution. Isolating switches, over current protection, fuses, junction boxes with terminal strips etc. as required for sub-distribution shall be deemed to be in bidder's scope.

COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.	स्वतंत्रता एवं गोपनीय यह दस्तावेज मे दी गई सूचना भारत हेवी इलेक्ट्रिकल्स लिमिटेड की संपत्ति है, इसका प्रयोग एवं प्रसारण केवल मे ही करी जा सकता है, अन्यथा इसे कानूनी के दायरे में लाया जाएगा।	दिनांक एवं हस्ताक्षर SIGN & DATE 	Rev. no.		निर्माणकर्ता WORKED BY:	Anil / Kavita		18.03.16
			आगामी पूर्ण सूची INVENTORY NO. 18508	08	जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh		18.03.16



दिनांक एवं हस्ताक्षर SIGN & DATE	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">  <p>उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)</p> </div> <div style="text-align: right;"> <p>ST39013</p> <p>पृष्ठ 40 का 7</p> <p>Page 7 of 40</p> </div> </div>
SUPERSEDES INVENTORY NO जानकारी सूची संख्या को अधिकतम करना है COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company. स्वतंत्रतापूर्वक एवं गोपनीय इस दस्तावेज से ही एवं केवल भारत भारती इंजीनियरिंग लिमिटेड की समझौते है इसके प्रयुक्त एवं आशयक रूप से किसी भी तरह प्रयोग, जो कि कंपनी के लिए से हानिकारक हो न किया जाए।	<p>(e) Motor shall be flame proof as per IS: 2148 and make shall be of BHEL approved vendor make. Motor shall be preferably of class 2 or better in efficiency rating. If motor of any other efficiency is required, the same will be intimated to vendor during enquiry. Technical requirement for motor is given in Annexure-III.</p> <p>(f) The temperature of the oil leaving the heater shall be automatically controlled by RTD in not less than 3 steps. RTD shall function to open the heater circuits when the desired temperature is exceeded & to close the heater circuits before the temperature drops below that necessary for proper purification of the oil. The heater circuits shall be interlocked with the pump motor circuits to shut off the heaters when the pumps are not being operated. Heater rating should be as given in Table-A. Heaters shall be designed to operate in minimum of three steps & shall be of indirect type.</p> <p>(g) In case of polishing filter, it shall be equipped with a differential pressure switch with adjustable contracts to indicate high pressure drop across the filter along with alarm & annunciation system.</p> <p>(h) Local instruments for pressure temp. & flow indication shall be provided in accordance with clause 8.0 of Annexure-I.</p> <p>(i) The unit should be provided with suitable alarm & annunciation system for easy operation & identification of fault conditions. It should have spare outputs in the form of potential free contact to be hooked-up with central annunciation system in the room.</p> <p>(j) All control switches, indicating lamps & sound alarm devices shall be mounted on the front face plate of a cubicle (panel) to be supplied with purification unit.</p> <p>(k) Remote operating facility for all electrically operated components should be provided on control panel.</p> <p>(l) All motors, heaters included in the offer, should be supplied along with its starter which will be mounted in the same panel.</p> <p>(m) An arrangement to detect and raise alarm in case of liquid seal breakage shall be provided. It may be adequately sized anti-flood tank with necessary drain valves along with level gauge or any other equivalent arrangement as per standard practice of the vendor. Drain and vent connections for level switch specified in Annexure-III to ST39013 shall be NB15 (ø21.3X2.6).</p> <p>(n) Control switches & Indicating lamps shall be as per vendor's standard practice or owner approved vendor/ make (project dependent).</p>
दिनांक एवं हस्ताक्षर SIGN & DATE जानकारी सूची संख्या INVENTORY NO	<div style="display: flex; justify-content: space-between;"> <div> <p>Rev. no.</p> <p>08</p> </div> <div> <p>निर्माणकर्ता WORKED BY:</p> <p>जाँचकर्ता CHECKED BY:</p> </div> <div> <p>Anil / Kavita</p> <p>A. S. Rajput / Devesh</p> </div> <div> <p>Anil Kumar Kavita</p> <p>A. S. Rajput Devesh</p> </div> <div> <p>18.03.16</p> <p>18.03.16</p> </div> </div>


SIGN & DATE 2/3/16		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013	
			पृष्ठ 40 का 8 Page 8 of 40	
SUPERSEDES INVENTORY NO 2538	<p>(o) If a common control panel is provided by vendor for two or more oil purifiers running in parallel, then control panel should be designed in such a way that it allows control of both the separators on the same panel. Control panel & controls shall also be able to work a purifier satisfactorily while one purifier is in shutdown/ breakdown.</p> <p>(p) Local Panel (LCP) construction: Type: Fabricated from cold rolled sheet steel Frame thickness: 2.0 mm Enclosure thickness: 1.6 mm Gland plate thickness: 3.0 mm</p> <p>(q) ON/OFF control, indication, and alarm functions shall be provided on the LCP as well as on HMI system (DCS).</p> <p>(r) Adequately sized copper ground bus shall be provided for each panel.</p> <p>(s) Control voltage shall be 110 V AC/220 VAC. This will be informed at the time of detail Engineering.</p> <p>(t) Cables for Motors and heaters shall be adequately sized keeping sufficient margin. Sizes shall be subject to BHEL/Customer approval.</p> <p>(u) Cable glands suitable for incoming 415 V feeder cables shall be provided. Cable Sizes will be intimated later.</p> <p>(v) LCP shall have 20% spare terminals.</p> <p>(w) Polishing filter (if applicable), chock alarm shall be provided through DPS.</p> <p>(x) All instruments/ Devices shall have IP55 degree of protection.</p> <p>(y) For level switches and other instruments, plug and socket type connectors shall be provided. For level switch over range proof pressure shall be 150% of max design pressure.</p> <p>(z) For Pressure gauge, Temperature gauge and level gauge over range test pressure shall be 1.5 times the maximum design pressure at 38 C. Range selection should cover 125% of max of scale. For Rotameter, the housing shall be IP55 protection class.</p> <p>(aa) Reports of type tests shall be those conducted within last five years.</p>			
Rev. no. 08	निर्माणकर्ता WORKED BY:	Anil / Kavita	Anil kumar Kavita	18.03.16
जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh	A. S. Rajput Devesh	18.03.16	18.03.16


भारत भारती SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013			
			पृष्ठ 40 का 9 Page 9 of 40			
समूची सूची संख्या INVENTORY NO P-5538	सुपरसेड INVENTORY NO	(bb) The local control panel shall have main switch fuse unit, power contactors, control transformer, space heater, alarm lamps, terminals, switchgear, OLR for separator motors and heaters and other contactors.				
		(cc) Interconnection diagram shall be provided along with offer.				
समूची सूची संख्या INVENTORY NO P-5538	सुपरसेड INVENTORY NO	(dd) Anti vibration pads shall be provided. Control panel should also be designed in such a way that it is able to withstand the site vibrations.				
		(ee) Instruments/ equipments used in parallel system of 2x4500LPH system shall be of same make & type for both the purifiers in a single project.				
समूची सूची संख्या INVENTORY NO P-5538	सुपरसेड INVENTORY NO	4.2 For DCS control panel, additional requirements				
		The purification system shall be operated from control room as well as local panel having the logic built in BHEL control system instead of relay based control system.				
समूची सूची संख्या INVENTORY NO P-5538	सुपरसेड INVENTORY NO	It shall also have Local/remote switch, separator start/stop selector Switch, heater on/off sel. Switch Test/Accept/Reset push buttons and 24 V DC interfacing relays with DCS.				
		Control Philosophy				
समूची सूची संख्या INVENTORY NO P-5538	सुपरसेड INVENTORY NO	(a) The purification system shall be operated from control room, as well as local control panel "DCS/Local" selector switch shall be provided on the LCP.				
		(b) All field instruments shall be wired to a JB, which shall be in vendor scope. From JB these shall be wired to DCS by BHEL.				
समूची सूची संख्या INVENTORY NO P-5538	सुपरसेड INVENTORY NO	(c) Operating sequence and interlocks for various drives shall be programmed in BHEL's DCS. Vendor shall furnish Logic diagram and write-up for operation of the system. All interlocks shall be clearly brought out in the logic diagram and write-up.				
		(d) 24V Interfacing relay are to be supplied by vendor mounted in the LCP for operation of drives. 24V commands shall be given from DCS to these relays for operation of various drives.				
समूची सूची संख्या INVENTORY NO P-5538	सुपरसेड INVENTORY NO	(e) Alarms shall be generated in DCS and output shall be given for driving the alarm windows in LCP.				
		(f) Control of individual heaters stages shall be from DCS for maintaining required oil temp using 2 nos. duplex RTDs.				
समूची सूची संख्या INVENTORY NO P-5538	सुपरसेड INVENTORY NO	Rev. no.	निर्माणकर्ता WORKED BY:	Anil / Kavita	Anil Kumar Kavita	18.03.16
		08	जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh	A. S. Rajput Devesh	18.03.16


दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013		
			पृष्ठ 40 का 10 Page 10 of 40		
SUPERSEDES INVENTORY NO.	(g) Limit switch or any other alternate arrangement with BHEL approval shall be provided for separator cover for remote monitoring when operating in DCS. (h) Flow switch shall be provided at centrifuge inlet. (i) List of drives to be operated from DCS, list of instruments and list of alarms shall be furnished along with the offer. (j) Air requirement for 3-way valve shall be furnished with the offer. (k) Functional testing of system shall be done with local control panel and by simulating DCS outputs.				
भारतीय मूल संपत्ति का अधिकार भारतीय मूल संपत्ति का अधिकार	5 PERFORMANCE REQUIREMENTS a. The quality of purified oil at outlet of OPS at 65°C shall be as follows. (i) Particle size of impurities at the outlet of OPS shall be equal to or better than class 15/12 as per ISO 4406 from class 21/18 at the inlet of the oil purification system in single pass without removing any additives/ inhibitors present in the oil and maintaining the lubricating value of the oil. (ii) Moisture contents at the outlet of OPS shall be maximum 300 to 500 ppm from inlet of maximum 15000 ppm. b. Polishing filter shall be capable of handling the quantity of clean oil, coming out of the centrifuge & filtering it down to $\beta_3=1000$ or better including colloidal carbon but shall not remove any rust inhibitor or oxidation inhibitor. c. Noise level shall not exceed 85 decibel measured at a distance of 1 meter from the equipment and at height of 1.5 meter from the ground level. d. Facility of indirect heater for heating oil from 50°C to the temperature which is required to make separation of water and oil most effective shall be provided. But to take care of situation while temperature is much below than 50°C, an arrangement of utilizing the heater to elevate the temperature of oil in the main oil tank to 50°C shall be provided. Heater shall be provided with suitable bypass arrangement.				
स्वतंत्रता और गोपनीयता स्वतंत्रता और गोपनीयता	6 GUARANTEES 6.1 The unit should be guaranteed for trouble free operation for a minimum period of 18 months after commissioning or 36 months after dispatch whichever is earlier.				
दिनांक एवं हस्ताक्षर SIGN & DATE 20/03/16	भारतीय मूल संपत्ति का अधिकार भारतीय मूल संपत्ति का अधिकार	Rev. no. 08	निर्माणकर्ता WORKED BY:	Anil / Kavita Anil Kumar Kavita	18.03.16
भारतीय मूल संपत्ति का अधिकार भारतीय मूल संपत्ति का अधिकार	भारतीय मूल संपत्ति का अधिकार भारतीय मूल संपत्ति का अधिकार	जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh	A. S. Rajput Devesh	18.03.16



दिनांक एवं हस्ताक्षर SIGN & DATE		<div>बी एम ई एल</div> <div>BHEL</div>		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)		ST39013 पृष्ठ 40 का 11 Page 11 of 40	
सामग्री सूची संख्या INVENTORY NO		6.2 The purification level as indicated in clause 5.2 shall be guaranteed by the supplier.					
सामग्री सूची संख्या को अधिकृतित करता है		6.3 The supplier shall guarantee the power consumption of the motor at normal duty point.					
सामग्री सूची संख्या को अधिकृतित करता है		6.4 If during erection, commissioning and operation at site any deficiency in a part is detected with in guarantee period, BHEL site representative shall prepare the assessment report and a copy of the same shall be forwarded to the supplier. The supplier shall replace/ rectify the concerned items free of charge. The supplier if, he so desires may depute his representative at site at his own cost, otherwise the finding of BHEL/ Owner representative shall be final and binding on the supplier.					
सामग्री सूची संख्या को अधिकृतित करता है		6.5 Care should be taken during packing of electrical/electronic items to insure that there is no damage to these items during handling/transportation.					
सामग्री सूची संख्या को अधिकृतित करता है		7 QUALITY ASSURANCE, INSPECTION AND TESTING					
सामग्री सूची संख्या को अधिकृतित करता है		7.1 The manufacture shall conduct all tests required to ensure all the component parts of the oil purification unit offered conform to the requirements of the specification & in compliance with requirements of applicable codes & standards.					
सामग्री सूची संख्या को अधिकृतित करता है		7.2 The bidder shall submit along with his offer quality plan in the prescribed BHEL's format as per Annexure-VI.					
सामग्री सूची संख्या को अधिकृतित करता है		7.3 The particulars of the proposed shop tests & procedures for the tests shall be submitted to the BHEL / owner for approval along with quality plan.					
सामग्री सूची संख्या को अधिकृतित करता है		7.4 The equipments shall be dispatched only after inspection & clearance of material by BHEL/ Owner & approval of tests certificates by BHEL /Owner.					
सामग्री सूची संख्या को अधिकृतित करता है		7.5 The minimum tests / checks to be carried out on the unit as envisaged by purchaser are given below. This is however , not intended to form a comprehensive testing programme as it is supplier's responsibility to prepare the detailed quality plan, which should also include tests checks carried out by supplier as a part of their normal practice. This quality plan is subjected to the approval of BHEL & owner. BHEL/ Owner reserves the right to ask any more checks at the time of quality plan finalization.					
सामग्री सूची संख्या को अधिकृतित करता है		(1) TESTING OF MATERIALS: The material of each component that is bowl, bowl cover, disc, heater tubes, pump casing Shafts, gear/screw, valve body etc. shall be tested as per relevant specification for its composition & mechanical properties, viz. YS, UTS, impact strength, % elongation, % RA etc. suitable NDT on the above components to ensure freedom from surface & subsurface defects shall be carried out.					
सामग्री सूची संख्या को अधिकृतित करता है		(2) Following tests shall be carried out during various stages of manufacture at manufacture's works.					
दिनांक एवं हस्ताक्षर SIGN & DATE		Rev. no. 08		निर्माणकर्ता WORKED BY:		Anil / Kavita	
दिनांक एवं हस्ताक्षर SIGN & DATE		निर्माणकर्ता WORKED BY:		जाँचकर्ता CHECKED BY:		A. S. Rajput / Devesh	
सामग्री सूची संख्या INVENTORY NO		सामग्री सूची संख्या INVENTORY NO		सामग्री सूची संख्या INVENTORY NO		सामग्री सूची संख्या INVENTORY NO	



भारत एवं हरद्वार SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013	
			पृष्ठ 40 का 12 Page 12 of 40	
SUPERSEDES INVENTORY NO भारतीय मूल्य सूची में अतिरिक्त करना है	<p>(a) Check for dimensions of all the component parts including surface finish, radial run out of shaft</p> <p>(b) <u>NDT</u>:- Bowls shall be subjected to DP after final machining to ensure freedom from surface defects. Shaft shall be subjected to UT & DP to ensure freedom from internal & surface defects. All butt welds on oil piping shall be subjected to 10% RT & fillet welds to 100% MP/DP. Norms for acceptance to be informed in the offer for BHEL approval.</p> <p>(c) Static & dynamic balancing test on all rotating elements of the centrifuge. Acceptance Norms for vibration is 5.6 mm/s.</p> <p>(d) Hydraulic testing of all pressure parts including polishing filter if offered and vessel body etc. for 1.5 times of working pressure for 30 minutes & seat leakage test of valves at 1.0 times of working pressure for 30 minutes. No leakage to be ensured.</p> <p>(e) Performance test on feed & discharge oil pump, purifier motor, heaters, control system & other accessories. Reference & Acceptance norms for vibration to be informed in the offer for BHEL approval.</p> <p>(f) Type-test reports detailing the results for motors of similar ratings shall be furnished as called annexure III.</p> <p>(g) Routine test reports of motors to be furnished as per annexure III.</p> <p>(h) Control panel RTD, level switch & solenoid valve shall be subjected to the following final testing as applicable as routine test (unless otherwise stated) in addition to the stage inspection carried out by the vendor.</p> <p>(i) Dimensional checks as per approved drawing including proper cut outs, mounting of all instruments/ accessories etc. as per approved general arrangement drawing.</p> <p>(j) Functional/ operational checks of all wiring schematics, operational/ sequential interlocks etc. are applicable as per approved drawing.</p> <p>i) Degree of protection test as per IS: 2147 (Type test) at 2.0 KV.</p> <p>(k) High voltage test & IR measurement not less than 30 mega ohm (MΩ) before and after test.</p> <p>ii) Pick up and drop down test & performance with ±10% voltage variation.</p> <p>(l) Capacity test of complete oil purification system. During capacity test, the complete purifier shall be tested at manufacture's works for mechanical running, vibration & noise level, sequential operation & interlocks, test for vapour tightness (if applicable), maximum particle size & moisture</p>			
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited It must not be used directly or indirectly in any way detrimental to the interest of the company	स्वतंत्रता एवं गोपनीय इस दस्तावेज में दी गई सूचना भारत भारती गैरनिर्देशित निदेश की अवधि है इसका प्रयोग एवं प्रसारण केवल से किया जा सकता है अन्यथा यह कानून के विरुद्ध होगा। (इतिहास के अनुसार)			
भारत एवं हरद्वार SIGN & DATE 	18/03/16			
भारतीय मूल्य सूची INVENTORY NO P-55388	Rev. no. 08	निर्माणकर्ता WORKED BY: Anil / Kavita	जाँचकर्ता CHECKED BY: A. S. Rajput / Devesh	18.03.16 18.03.16

दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013	
			पृष्ठ 40 का 13 Page 13 of 40	
सुपरसेड INVENTORY NO.	content at the outlet of oil purification system. Acceptance norms for vibration to be informed in the offer for BHEL approval (m) Verification/ BHEL approved type-test report for max. particle size & moisture content.			
भारतीय प्रौद्योगिकी निगम Bharat Heavy Electricals Limited	7.6 Party to furnish certificate of compliance for the instruments which are being installed in the system after P.O. placement.			
भारतीय प्रौद्योगिकी निगम Bharat Heavy Electricals Limited	7.7 STORAGE:- Bidder shall inform to purchaser along with the offer regarding storage facility which they require at the site for their equipment if the unit is to be stored at site for their equipment. If the unit is to be stored at site for next 12 to 18 months after dispatch from manufacturer's works.			
COPYRIGHT AND CONFIDENTIAL 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.	8 DOCUMENTS, DATA AND DRAWINGS TO BE FURNISHED BY SUPPLIER			
स्वत्वधिकार एवं गोपनीयता यह दस्तावेज भारतीय प्रौद्योगिकी निगम की संपत्ति है। इसका उपयोग केवल निर्धारित उद्देश्य के लिए किया जा सकता है। इस दस्तावेज को बिना अनुमति के किसी भी तृतीय पक्ष को नहीं देना चाहिए।	8.1 <u>DRAWINGS/ DOCUMENTS REQUIRED WITH THE OFFER</u>			
दिनांक एवं हस्ताक्षर SIGN & DATE	a. GA drawing of the equipment offered, arrangement and layout drawing showing various equipments with all fittings, accessories and connection as well as clearance necessary for other equipment or structural members for operation and maintenance, loading data and foundation details of oil purification system.			
दिनांक एवं हस्ताक्षर SIGN & DATE	b. Data sheets of all instruments including RTDs, motor, solenoid valves, instruments and 3-way pneumatic/solenoid valve for oil purification system shall be furnished as per Annexure-II of this specification for BHEL's review.			
दिनांक एवं हस्ताक्षर SIGN & DATE	c. P&ID including bill of material indicating piping, valves, all instruments and devices of the system as per BHEL format annexure-VII.			
दिनांक एवं हस्ताक्षर SIGN & DATE	d. Drawings / Documents of all equipments such as heater, y-strainer, dirty & clean oil pump etc. shall also be included in the offer.			
दिनांक एवं हस्ताक्षर SIGN & DATE	e. Detailed technical literature on various equipments/ instruments and GA drawing of control panel.			
दिनांक एवं हस्ताक्षर SIGN & DATE	f. Characteristic curves of all pumps.			
दिनांक एवं हस्ताक्षर SIGN & DATE	g. Manufacturer's descriptive and illustrative literature showing details of equipments and method of operation of the complete system.			
दिनांक एवं हस्ताक्षर SIGN & DATE	h. Electrical single line diagram, control wiring diagram, interlocks schematic, protection scheme, details of motor and starter etc.			
भारतीय प्रौद्योगिकी निगम INVENTORY NO.	Rev. no.	निर्माणकर्ता WORKED BY:	Anil / Kavita	18.03.16
भारतीय प्रौद्योगिकी निगम INVENTORY NO.	08	जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh	10.03.16



<div style="text-align: center;">  <p>उत्पाद क्रय विनिर्देश (हीप : हरिद्वार)</p> <p>PRODUCT PURCHASE SPECIFICATION</p> <p>(HEEP: HARIDWAR)</p> </div>	<div style="float: right; text-align: right;"> ST39013 पृष्ठ 40 का 14 Page 14 of 40 </div>	
<div style="writing-mode: vertical-rl; transform: rotate(180deg);"> SIGN & DATE INVENTORY NO. SUPERSEDES INVENTORY NO. </div>	<ol style="list-style-type: none"> Cross-sectional drawings of all equipments including horizontal and vertical section of separator indicating the recommended and mandatory spare parts. Also, list of recommended and mandatory spares with their part no. / model no. and quantity required. Details of standards /codes used for designing of the various equipments and selecting the material of various components. Name of the manufacturer and illustrative literature all components which have been out-sourced for purchaser's review. All other relevant data and drawings which supplier considers necessary for better understanding of the system. Type test Reports for capacity, moisture content, particle size of impurities and motor efficiency conducted within last 5 years. Interconnecting diagram of DCS control panel (if required). Acceptance norms for (i) in process NDT of bowl, shaft, butt welds of piping. (ii) Static & dynamic balancing of shaft. (iii) Performance test on pumps & motors. (iv)Vibration norms for pumps, motor and unit. Also, Bidder to shall furnish the filled up check list of BHEL format as per annexure –VII. <p>8.2 DRAWINGS / DOCUMENTS REQUIRED WITHIN 30 DAYS AFTER PLACEMENT OF ORDER</p> <ol style="list-style-type: none"> Five sets (paper based) of each of GA drawing, P&ID, filled in data sheet, control panel schematic & write-up etc. shall be furnished for review/ approval by BHEL/CUSTOMER after placement of order. Motor datasheet, curves/ graphs, type- test reports, efficiency rating etc. for review/ approval by BHEL/CUSTOMER after placement of order. O & M manual (soft/ paper based) shall be furnished for BHEL review/ approval. <p>8.3 DRAWINGS/ DOCUMENTS REQUIRED ALONGWITH SUPPLY</p> <ol style="list-style-type: none"> All relevant test certificates & full details of the tests carried out as per the requirement of this specification before dispatch. Twenty sets (paper based) and 2 set (in CDROM) of O&M manual shall be furnished containing all drawings and datasheets, catalogues of all instruments and instructions for storage, erection & 	
<div style="writing-mode: vertical-rl; transform: rotate(180deg);"> COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company. </div>	<div style="writing-mode: vertical-rl; transform: rotate(180deg);"> स्वामित्व अधिकार एवं गोपनीयता इस दस्तावेज में दी गई जानकारी भारत भारी यंत्रोद्योग निगम की संपत्ति है। इसे किसी भी रूप में बिना अनुमति के प्रयोग नहीं किया जा सकता है। </div>	<div style="writing-mode: vertical-rl; transform: rotate(180deg);"> SIGN & DATE INVENTORY NO. </div>
INVENTORY NO.	Rev. no. 08	निर्माणकर्ता WORKED BY: Anil / Kavita जाँचकर्ता CHECKED BY: A. S. Rajput / Devesh तिथि Date: 18.03.16

दिनांक एवं हस्ताक्षर SIGN & DATE 11/11/2016		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013																	
			पृष्ठ 40 का 15 Page 15 of 40																	
SUPERSEDES INVENTORY NO. भारतीय प्रोपर्टी निगम में अधिलेखित करना है	commissioning, operation and maintenance after approval. Vendor shall keep 2 copies of O&M manual in the dispatch box & shall also mention the same in its shipping list. c. Before bidder finalises these manuals, the same will be reviewed by purchaser. After getting approval of purchaser, final manual in required quality shall be dispatched. Manual shall clearly indicate all inspections & tests to be carried out at site and if any check list/ log sheets etc. are required to carry-out specified inspection & test that shall be made part of manual. d. Data sheets of all instruments, thermostats and motor .The same shall be included in O&M manual of oil purification system along with the catalogues of all instruments.																			
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited It must not be used directly or indirectly in any way detrimental to the interest of the company	9 MATERIALS OF CONSTRUCTION 9.1 The material of all rotating parts / components i.e. "bowl, bowl cover, disc, Shaft/spindle, gear/screw shall be of high grade stainless steel (e.g. austenitic) considering the purpose and the extent of contact with oil. Other parts coming in direct contact with water shall be of stainless steel or other corrosion resistant material conforming to applicable standard (IS / BS) or equivalent standard. All those parts that are coming in contact with oil & are not of Stainless steel / other corrosion resistant shall be mentioned in their offer. This should be submitted as a separate document indicating material/ make of all parts. 9.2 All piping, fittings & valves should be suitably selected as per applicable IS, BS or equivalent standard. 9.3 Strainers, wherever provided, should be designed to enable them to be cleaned during operation. 9.4 All other parts/ components shall be of compatible material to suit the applications.																			
	10 CODES AND STANDARDS In addition to the codes and standards specifically mentioned in the relevant technical specification for the equipment/ plant/ system, all equipment parts, systems and works covered under this specification shall comply with all currently applicable statutory regulations and safety codes (National/International).																			
स्वत्वसिद्धि एवं गोपनीयता इस दस्तावेज में दी गई प्रतियां भारत भारती लव्हाइल्लिक्शन लिमिटेड की संपत्ति हैं। इनका प्रयोग एवं प्रसारण केवल केवल के निर्देशों के बिना नहीं किया जा सकता। भारतीय प्रोपर्टी निगम में अधिलेखित करना है	11 CLEANING, PROTECTION AND PAINTING Painting scheme shall be according to BHEL approved/ previously approved scheme. Painting scheme for oil purification system shall be as below.																			
दिनांक एवं हस्ताक्षर SIGN & DATE 11/11/2016	<table border="1"> <thead> <tr> <th>Paint (Coat)</th> <th>Paint Type</th> <th>No. of coat</th> <th>DFT*</th> </tr> </thead> <tbody> <tr> <td>Primer Paint:</td> <td>Epoxy base Zinc rich primer paint</td> <td>2</td> <td>70</td> </tr> <tr> <td>Intermediate Paint:</td> <td>Epoxy TiO2 Pigmented Polyamide Cured Paint</td> <td>1</td> <td>70</td> </tr> <tr> <td>Finish (Final) Paint:</td> <td>Aliphatic Acrylic 2 Pack Polyurethane Finish paint</td> <td>2</td> <td>60</td> </tr> </tbody> </table>				Paint (Coat)	Paint Type	No. of coat	DFT*	Primer Paint:	Epoxy base Zinc rich primer paint	2	70	Intermediate Paint:	Epoxy TiO2 Pigmented Polyamide Cured Paint	1	70	Finish (Final) Paint:	Aliphatic Acrylic 2 Pack Polyurethane Finish paint	2	60
Paint (Coat)	Paint Type	No. of coat	DFT*																	
Primer Paint:	Epoxy base Zinc rich primer paint	2	70																	
Intermediate Paint:	Epoxy TiO2 Pigmented Polyamide Cured Paint	1	70																	
Finish (Final) Paint:	Aliphatic Acrylic 2 Pack Polyurethane Finish paint	2	60																	
भारतीय प्रोपर्टी निगम INVENTORY NO. 11/11/2016	Rev. no. 08	निर्माणकर्ता WORKED BY:	Anil / Kavita	Anil Kumar Kavita 18.03.16																
		जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh	Rajput Devesh 18.03.16																



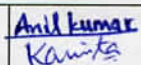
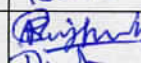
निर्माण एवं मंजूरी SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013	
			पृष्ठ 40 का 16 Page 16 of 40	
SUPERSEDES INVENTORY NO. आगामी पूर्वी मंजूरी अतिरिक्तिक रूप से	Total Minimum DFT= 180 *DFT– Dry Film Thickness (Final) in micron. Paint Shade shall be as below:- <ul style="list-style-type: none"> For Oil purifier- Light Blue (RAL 5012) For Control Panel generally it is - External-Light Grey (shade 631 of IS-5), Internal- Brilliant White or paint shade will be informed during later stage of engineering. 			
COPYRIGHT AND CONFIDENTIAL 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.				
11.1 All surfaces shall be thoroughly cleaned of all mill scales, oxides and other coating and prepared in the shops. The protective coating should be such as to prevent the deterioration of coating itself by him for internal and external surface protection which shall be checked and approved by BHEL / Owner. All surfaces which will not be easily accessible after the shop assembly, shall before hand be treated and protected for life of the equipment. 11.2 The pre-treatment/ painting of the control panel shall be done by 7 tank process/ shot blasting/ sand blasting, by 2 coats of primer and 2 coats of paint of shade no. 692 as per IS: 6005. The total thickness of paint shall be a minimum of 180 micron and maximum of 250 micron. 11.3 After testing of unit, its internals shall be thoroughly cleaned, dried and conserved before packing. Conservation shall be suitable for storing in saline atmosphere & for a period of 2 years before use. Unit shall be suitably packed for transportation. Supplier shall be responsible for all loss or damage during transportation, handling and storage due to improper packing. 11.4 Painting treatment for LCP shall be as per IS: 6005. Two coats of lead oxide primer followed by powder painting. External shade for front and Rear shall be RAL9002 and for panel sides shall be RAL5012. Internal color shall be same as external color indicated above.				
12 DESIGN CO-ORDINATION MEETING Supplier shall attend the meeting on his own cost, whenever felt necessary, called by purchaser / owner to clarify the subject matter to them during engineering, erection, commissioning, and any stage prior to handing over.				
13 LIST OF CROSS-REFERRED STANDARDS				
13.1 IS: 10816-2 13.2 IS: 325, 13.3 IS: 4029, 13.4 IS: 2147, 13.5 IS: 2148, 13.6 IS: 6005,				
निर्माण एवं मंजूरी SIGN & DATE 	Rev. no. 08	निर्माणकर्ता WORKED BY:	Anil / Kavita	Anil Kumar Kavita 18.03.16
आगामी पूर्वी मंजूरी INVENTORY NO. 12.5538		जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh	Rajput Devesh 18.03.16


दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013	
			पृष्ठ 40 का 17 Page 17 of 40	
भारतीय मूल्य संवर्धन INVENTORY NO.	13.7 IS: 5, 13.8 IS: 4722, 13.9 IS: 2253, 13.10 IS: 2254, 13.11 IS: 3202, 13.12 IS: 4722-1992, 13.13 ISO: 4406, 13.14 IS: 12075, 13.15 IS: 12615:2011, 13.16 IS: 10816-2.			
COPYRIGHT AND CONFIDENTIAL 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.				
स्वामित्व अधिकार एवं गोपनीयता यह दस्तावेज भारतीय मूल्य संवर्धन द्वारा तैयार किया गया है। इसका उपयोग केवल भारतीय मूल्य संवर्धन के लिए ही किया जा सकता है। इस दस्तावेज में कोई भी जानकारी बिना भारतीय मूल्य संवर्धन की अनुमति के नहीं दी जा सकती है।				
दिनांक एवं हस्ताक्षर SIGN & DATE				
भारतीय मूल्य संवर्धन INVENTORY NO.	Rev. no. 08	निर्माणकर्ता WORKED BY:	Anil / Kavita	Anil kumar Kavita 18.03.16
		जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh	A. S. Rajput Devesh 10.03.16

18.03.16

निम्न एवं हस्ताक्षर SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)		ST39013																													
				पृष्ठ 40 का 19 Page 19 of 40																													
SUPERSEDES INVENTORY NO.	<table border="1"> <thead> <tr> <th>S. No.</th> <th>Properties</th> <th>Value</th> <th>Test Method</th> </tr> </thead> <tbody> <tr> <td></td> <td>(c) At 24°C after testing at 93.5°C</td> <td>Nil</td> <td></td> </tr> <tr> <td>13.</td> <td>De-aeration capacity at 50°C</td> <td>6 Minute Max.</td> <td>DIN 51381</td> </tr> <tr> <td>14.</td> <td>Ash (by weight)</td> <td>Max. 0.01</td> <td>IS : 1448- P4</td> </tr> <tr> <td>15.</td> <td>Water content by weight</td> <td>% gm below the limit of quantitative detectability.</td> <td>DIN 51592</td> </tr> <tr> <td>16.</td> <td>Mechanical solid impurities.</td> <td>Below the limit of quantitative detectability.</td> <td>DIN 51592</td> </tr> <tr> <td>17.</td> <td>Water separation capacity After steam treatment.</td> <td>Max. 300 seconds</td> <td>DIN 51589</td> </tr> </tbody> </table>					S. No.	Properties	Value	Test Method		(c) At 24°C after testing at 93.5°C	Nil		13.	De-aeration capacity at 50°C	6 Minute Max.	DIN 51381	14.	Ash (by weight)	Max. 0.01	IS : 1448- P4	15.	Water content by weight	% gm below the limit of quantitative detectability.	DIN 51592	16.	Mechanical solid impurities.	Below the limit of quantitative detectability.	DIN 51592	17.	Water separation capacity After steam treatment.	Max. 300 seconds	DIN 51589
S. No.	Properties	Value	Test Method																														
	(c) At 24°C after testing at 93.5°C	Nil																															
13.	De-aeration capacity at 50°C	6 Minute Max.	DIN 51381																														
14.	Ash (by weight)	Max. 0.01	IS : 1448- P4																														
15.	Water content by weight	% gm below the limit of quantitative detectability.	DIN 51592																														
16.	Mechanical solid impurities.	Below the limit of quantitative detectability.	DIN 51592																														
17.	Water separation capacity After steam treatment.	Max. 300 seconds	DIN 51589																														
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.																																	
स्वत्वाधिकार एवं गोपनीयता इस दस्तावेज़ में दी गई जानकारी भारत भारी विद्युत निर्यात लिमिटेड की संपत्ति है। इसका उपयोग अन्य किसी भी उद्देश्य के लिए या किसी भी प्रकार से बिना भारत भारी विद्युत निर्यात लिमिटेड की अनुमति के नहीं किया जा सकता।																																	
निम्न एवं हस्ताक्षर SIGN & DATE																																	
सामग्री सूची नम्बर INVENTORY NO.	Rev. no. 08	निर्माणकर्ता WORKED BY:	Anil / Kavita	Anil kumar Kavita	18.03.16																												
P-5538		जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh	A. S. Rajput / Devesh	18.03.16																												

18.03.16

दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)		ST39013 पृष्ठ 40 का 21 Page 21 of 40																																																																									
सामग्री सूची संख्या INVENTORY NO.	SUPERSEDES INVENTORY NO.	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:10%;">3.5</td> <td style="width:60%;">Speed</td> <td style="width:30%;">RPM</td> </tr> <tr> <td>3.6</td> <td>Particle size distribution of impurities in purified oil at outlet of centrifuge in single pass as per ISO 4406</td> <td></td> </tr> <tr> <td>3.7</td> <td>Particle size distribution of impurities in purified oil at outlet of oil purification system (i.e. polishing filter) in single pass as per ISO 4406</td> <td></td> </tr> <tr> <td>3.8</td> <td>Moisture/Water content in purified oil at outlet of oil purification system / polishing filter</td> <td>ppm</td> </tr> <tr> <td>3.9</td> <td><u>OIL TEMPERATURES</u></td> <td></td> </tr> <tr> <td>3.9.1</td> <td>Inlet to electric heater</td> <td>°C (Max), °C (Min)</td> </tr> <tr> <td>3.9.2</td> <td>Outlet from electric heater</td> <td>°C (Not to exceed 90°C)</td> </tr> <tr> <td>3.10</td> <td>Water temperature in the heater tank</td> <td></td> </tr> <tr> <td>3.11</td> <td>Bearings :</td> <td></td> </tr> <tr> <td>3.11.1</td> <td>Nos.</td> <td></td> </tr> <tr> <td>3.11.2</td> <td>Type</td> <td></td> </tr> <tr> <td>3.11.3</td> <td>Manufacturer</td> <td></td> </tr> <tr> <td>3.12</td> <td>Dirt holding capacity of the bowl</td> <td></td> </tr> </table> <p>4.0 CONSTRUCTION FEATURES OF CENTRIFUGE</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:10%;">4.1</td> <td style="width:60%;">Automatic tripping of all electric motors on actuation of anti-flood device</td> <td style="width:30%;">Not provided /provided</td> </tr> <tr> <td>4.2</td> <td>Cleaning of centrifuge bowl</td> <td>Self-cleaning/manual</td> </tr> <tr> <td>4.3</td> <td>Type of centrifuge drive</td> <td>Worm & Gear /Belt</td> </tr> <tr> <td>4.4</td> <td>If centrifuge is belt driven automatic tripping of all electric motors on belt failure.</td> <td>Not Provided/Provided</td> </tr> <tr> <td>4.5</td> <td>Hand brake</td> <td>Not Provided/Provided</td> </tr> </table> <p>5.0 MATERIALS OF CONSTRUCTION OF CENTRIFUGE (INDICATE STANDARDS)</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:10%;">5.1</td> <td style="width:60%;">Bowl body</td> <td style="width:30%;"></td> </tr> <tr> <td>5.2</td> <td>bowl cover</td> <td></td> </tr> <tr> <td>5.3</td> <td>Separating discs</td> <td></td> </tr> <tr> <td>5.4</td> <td>Drive shaft</td> <td></td> </tr> <tr> <td>5.5</td> <td>Bowl nut</td> <td></td> </tr> <tr> <td>5.6</td> <td>Worm & Gear /Belt</td> <td></td> </tr> </table>				3.5	Speed	RPM	3.6	Particle size distribution of impurities in purified oil at outlet of centrifuge in single pass as per ISO 4406		3.7	Particle size distribution of impurities in purified oil at outlet of oil purification system (i.e. polishing filter) in single pass as per ISO 4406		3.8	Moisture/Water content in purified oil at outlet of oil purification system / polishing filter	ppm	3.9	<u>OIL TEMPERATURES</u>		3.9.1	Inlet to electric heater	°C (Max), °C (Min)	3.9.2	Outlet from electric heater	°C (Not to exceed 90°C)	3.10	Water temperature in the heater tank		3.11	Bearings :		3.11.1	Nos.		3.11.2	Type		3.11.3	Manufacturer		3.12	Dirt holding capacity of the bowl		4.1	Automatic tripping of all electric motors on actuation of anti-flood device	Not provided /provided	4.2	Cleaning of centrifuge bowl	Self-cleaning/manual	4.3	Type of centrifuge drive	Worm & Gear /Belt	4.4	If centrifuge is belt driven automatic tripping of all electric motors on belt failure.	Not Provided/Provided	4.5	Hand brake	Not Provided/Provided	5.1	Bowl body		5.2	bowl cover		5.3	Separating discs		5.4	Drive shaft		5.5	Bowl nut		5.6	Worm & Gear /Belt	
3.5	Speed					RPM																																																																							
3.6	Particle size distribution of impurities in purified oil at outlet of centrifuge in single pass as per ISO 4406																																																																												
3.7	Particle size distribution of impurities in purified oil at outlet of oil purification system (i.e. polishing filter) in single pass as per ISO 4406																																																																												
3.8	Moisture/Water content in purified oil at outlet of oil purification system / polishing filter					ppm																																																																							
3.9	<u>OIL TEMPERATURES</u>																																																																												
3.9.1	Inlet to electric heater					°C (Max), °C (Min)																																																																							
3.9.2	Outlet from electric heater					°C (Not to exceed 90°C)																																																																							
3.10	Water temperature in the heater tank																																																																												
3.11	Bearings :																																																																												
3.11.1	Nos.																																																																												
3.11.2	Type																																																																												
3.11.3	Manufacturer																																																																												
3.12	Dirt holding capacity of the bowl																																																																												
4.1	Automatic tripping of all electric motors on actuation of anti-flood device	Not provided /provided																																																																											
4.2	Cleaning of centrifuge bowl	Self-cleaning/manual																																																																											
4.3	Type of centrifuge drive	Worm & Gear /Belt																																																																											
4.4	If centrifuge is belt driven automatic tripping of all electric motors on belt failure.	Not Provided/Provided																																																																											
4.5	Hand brake	Not Provided/Provided																																																																											
5.1	Bowl body																																																																												
5.2	bowl cover																																																																												
5.3	Separating discs																																																																												
5.4	Drive shaft																																																																												
5.5	Bowl nut																																																																												
5.6	Worm & Gear /Belt																																																																												
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.		स्वतंत्रतापूर्वक एवं गोपनीय इस दस्तावेज में दी गई सूचना भारत भारी भारी विद्युत निगम की संपत्ति है। इसका प्रयोग एवं प्रसारण अन्य से किसी भी तरह प्रयोग और बिना अनुमति के किया जाये।																																																																											
दिनांक एवं हस्ताक्षर SIGN & DATE																																																																													
सामग्री सूची संख्या INVENTORY NO.	Rev. no.																																																																												
सामग्री सूची संख्या INVENTORY NO.	निर्माणकर्ता WORKED BY:	Anil / Kavita		18.03.16																																																																									
सामग्री सूची संख्या INVENTORY NO.	जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh		18.03.16																																																																									

दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)		ST39013	
				पृष्ठ 40 का 22	
				Page 22 of 40	
SUPERSEDES INVENTORY NO					
सामग्री सूची संख्या की अवधिगतता करना है					
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited It must not be used directly or indirectly in any way detrimental to the interest of the company					
स्वत्वधिकार एवं गोपनीयता इस दस्तावेज में दी गई सूचना भारत भारती भारतीभारत लिमिटेड की सम्पत्ति है। इसका प्रयोग एवं प्रसारण अन्य से किसी भी तरह, प्रत्यक्ष या अप्रत्यक्ष, बिना भारत भारती लिमिटेड की लिखित अनुमति के किये जाने पर प्रतिबंधित है।					
दिनांक एवं हस्ताक्षर SIGN & DATE					
सामग्री सूची संख्या INVENTORY NO					

5.7	Oil injection nozzle	
5.8	Other inlet and outlet parts	
5.9	Other wetted bowl parts	
5.10	Valve Body	

6.0 DESIGN/CONSTRUCTION FEATURES OF ELECTRIC HEATER

6.1	Heater details	
6.1.1	Quantity	Nos.
6.1.2	Kilowatts	kW
6.1.3	Rating of steps (kW)	
6.1.4	Voltage	Volts (AC)
6.1.5	Frequency	C/s
6.1.6	Phase	
6.1.7	Number of thermostat	3 (2Nos. for oil temp. and one for water temp.)
6.1.8	Range	
6.1.9	Model	
6.1.10	Manufacturer	
6.2	Heater control thermostat setting	Cut in at °C/ Cut out at °C
6.2.1	Rating of thermostat contacts	5 amps 240V A.C 0.25 amps 240V D.C
6.2.2	No. of contacts	2 No + 2 N C
6.3	Heater tubes	
6.3.1	Material	
6.3.2	Number	
6.3.3	Length	mm
6.3.4	Outside diameter	mm
6.3.5	Tube wall thickness	mm
6.3.6	Surface area of heater tubes.	mm ²
6.4	Tube Sheets	
6.4.1	Material	
6.4.2	Number	
6.4.3	Thickness	mm
6.5	Tube bundle type	Removable/non-removable
6.6	Capacity of heater tank	M3

7.0 CENTRIFUGE FEED PUMP & DISCHARGE PUMP

	FEED PUMP	DISCHARGE PUMP
--	-----------	----------------

Rev. no.		निर्माणकर्ता WORKED BY:	Anil / Kavita	Anil kumar Kavita	18.03.16
08		जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh	A. S. Rajput Devesh	18.03.16

निष्कर्ष एवं हस्ताक्षर SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013
			पृष्ठ 40 का 23
			Page 23 of 40


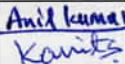
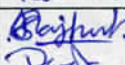
SUPERSEDES INVENTORY NO. सामग्री पूर्ण संख्या को अपडेट किया गया है	7.1	Quantity	Nos.		
	7.2	Type	Positive displacement (Rotary i.e. Helical, Herring bone , spur gear or screw type)		
	7.3	Capacity	Lit/hr.		
	7.4	Speed	RPM		
	7.5	Discharge pressure	Kg/cm2 (g)		

COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited It must not be used directly or indirectly in any way detrimental to the interest of the company	7.6	Relief valve setting	Kg/cm2 (g)		
	7.7	Max. allowable pump working pressure	Kg/cm2 (g)		
	7.8	Connections			
	7.8.1	Inlet	mm		
	7.8.2	outlet	mm		
	7.9	Material			
	7.9.1	Casing			
	7.9.2	Shaft			
	7.9.3	Shaft sleeves			
	7.9.4	Gear/screw			
	7.10	Drive (AC Motor)	As per enclosed annexure-3.		
	7.11	Motor rating	KW		
	7.12	Bearings :			
7.12.1	Nos.				
7.12.2	Type				
7.12.3	Manufacturer				
7.13	BHP at rated capacity				

8.0 Y-STRAINER

8.1	Make & Model	
8.2	Number	
8.3	Location	
8.4	Connection sizes	
8.5	Mesh size	
8.6	Material of element	

9.0 POLISHING FILTER

निष्कर्ष एवं हस्ताक्षर SIGN & DATE 	सामग्री पूर्ण संख्या INVENTORY NO. P-5598	Rev. no.		निर्माणकर्ता WORKED BY:	Anil / Kavita		18.03.16
				जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh		18.03.16

Page | 24 of 40

SUPERSEDES
INVENTORY NO.

ਸਮਾਜੀ ਸੁਖੀ ਸੰਸਥਾ ਕੋ
ਅਧਿਕਾਰਿਤ ਅਦਾਰਾ ਹੈ

COPYRIGHT AND CONFIDENTIAL

The information on this document is the property of Bharat Heavy Electrical Limited must not be used directly or indirectly in any way detrimental to the interest of the company

स्वत्वाधिकार एवं गोपनीय

SIGN & DATE

INVENTORY

Rev. no.


निर्माणकर्ता
WORKED BY:
जाँचकर्ता
CHECKED BY:

Anil / Kavita
A. S. Rajput / Devesh




Amil Kumar
Komits
Bayank.
Dastak


18.03.16
19.03.16


18.03.16



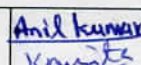
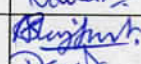
SIGN & DATE SIGNATURE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)		ST39013 पृष्ठ 40 का 26 Page 26 of 40																																																																																																							
		<div style="display: flex; justify-content: space-between;"> <div style="width: 15%;"> SUPERSEDES INVENTORY NO. सामग्री सूची नम्बर को अतिरिक्त करना है </div> <div style="width: 85%;"> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;"></td> <td style="width: 45%;"></td> <td style="width: 40%;">to be provided for external cable connection</td> </tr> <tr> <td>13.5.4</td> <td>Sheeting of RTD</td> <td>Metal sheathed, ceramic packed</td> </tr> <tr> <td>13.5.5</td> <td>Calibration & accuracy</td> <td></td> </tr> <tr> <td>13.5.6</td> <td>Thermo well</td> <td></td> </tr> <tr> <td>13.5.7</td> <td>Model no.</td> <td></td> </tr> <tr> <td>13.5.8</td> <td>Manufacturer</td> <td></td> </tr> <tr> <td>13.6</td> <td colspan="2">LEVEL SWITCH (For detail specification, refer annexure-IV)</td> </tr> <tr> <td>13.6.1</td> <td>Number</td> <td></td> </tr> <tr> <td>13.6.2</td> <td>Type</td> <td></td> </tr> <tr> <td>13.6.3</td> <td>Location</td> <td>Indirect oil heater Anti-flood device</td> </tr> <tr> <td>13.6.4</td> <td>Range</td> <td></td> </tr> <tr> <td>13.6.5</td> <td>Manufacturer</td> <td></td> </tr> <tr> <td>13.6.6</td> <td>Model no.</td> <td></td> </tr> <tr> <td>13.6.7</td> <td>No. of contacts & contact rating</td> <td>2 NOs. SPDT contacts 5A for 240 VAC 0.25A for 220 VOC</td> </tr> <tr> <td>13.7</td> <td colspan="2">LEVEL GAUGE</td> </tr> <tr> <td>13.7.1</td> <td>Number</td> <td></td> </tr> <tr> <td>13.7.2</td> <td>Type</td> <td></td> </tr> <tr> <td>13.7.3</td> <td>location</td> <td></td> </tr> <tr> <td>13.7.4</td> <td>Model No.</td> <td></td> </tr> <tr> <td>13.7.5</td> <td>Length</td> <td></td> </tr> <tr> <td>13.7.6</td> <td>Manufacturer</td> <td></td> </tr> <tr> <td>13.8</td> <td colspan="2">INDICATING TYPE DIFFERENTIAL PRESSURE SWITCH (across polishing filter)</td> </tr> <tr> <td>13.8.1</td> <td>Number</td> <td></td> </tr> <tr> <td>13.8.2</td> <td>Type</td> <td></td> </tr> <tr> <td>13.8.3</td> <td>Model No.</td> <td></td> </tr> <tr> <td>13.8.4</td> <td>No. of contacts & contact rating</td> <td></td> </tr> <tr> <td>13.8.5</td> <td>Manufacturer</td> <td></td> </tr> <tr> <td>13.8.6</td> <td>List of spares furnished for three (3) Years normal operation and maintenance Enclosed with bid.</td> <td>Yes/No</td> </tr> <tr> <td>13.8.7</td> <td>List of special tools furnished enclosed with bid.</td> <td></td> </tr> <tr> <td colspan="3">14.0 LT MOTORS(for details refer Annex III)</td> </tr> <tr> <td>14.1</td> <td colspan="2">GENERAL</td> </tr> <tr> <td>14.1.1.</td> <td colspan="2">Manufacturer & Country of origin.</td> </tr> <tr> <td>14.1.2.</td> <td colspan="2">Equipment driven by motor</td> </tr> <tr> <td>14.1.3.</td> <td colspan="2">Motor type</td> </tr> </table> </div> </div>						to be provided for external cable connection	13.5.4	Sheeting of RTD	Metal sheathed, ceramic packed	13.5.5	Calibration & accuracy		13.5.6	Thermo well		13.5.7	Model no.		13.5.8	Manufacturer		13.6	LEVEL SWITCH (For detail specification, refer annexure-IV)		13.6.1	Number		13.6.2	Type		13.6.3	Location	Indirect oil heater Anti-flood device	13.6.4	Range		13.6.5	Manufacturer		13.6.6	Model no.		13.6.7	No. of contacts & contact rating	2 NOs. SPDT contacts 5A for 240 VAC 0.25A for 220 VOC	13.7	LEVEL GAUGE		13.7.1	Number		13.7.2	Type		13.7.3	location		13.7.4	Model No.		13.7.5	Length		13.7.6	Manufacturer		13.8	INDICATING TYPE DIFFERENTIAL PRESSURE SWITCH (across polishing filter)		13.8.1	Number		13.8.2	Type		13.8.3	Model No.		13.8.4	No. of contacts & contact rating		13.8.5	Manufacturer		13.8.6	List of spares furnished for three (3) Years normal operation and maintenance Enclosed with bid.	Yes/No	13.8.7	List of special tools furnished enclosed with bid.		14.0 LT MOTORS(for details refer Annex III)			14.1	GENERAL		14.1.1.	Manufacturer & Country of origin.		14.1.2.	Equipment driven by motor		14.1.3.	Motor type	
				to be provided for external cable connection																																																																																																							
13.5.4	Sheeting of RTD	Metal sheathed, ceramic packed																																																																																																									
13.5.5	Calibration & accuracy																																																																																																										
13.5.6	Thermo well																																																																																																										
13.5.7	Model no.																																																																																																										
13.5.8	Manufacturer																																																																																																										
13.6	LEVEL SWITCH (For detail specification, refer annexure-IV)																																																																																																										
13.6.1	Number																																																																																																										
13.6.2	Type																																																																																																										
13.6.3	Location	Indirect oil heater Anti-flood device																																																																																																									
13.6.4	Range																																																																																																										
13.6.5	Manufacturer																																																																																																										
13.6.6	Model no.																																																																																																										
13.6.7	No. of contacts & contact rating	2 NOs. SPDT contacts 5A for 240 VAC 0.25A for 220 VOC																																																																																																									
13.7	LEVEL GAUGE																																																																																																										
13.7.1	Number																																																																																																										
13.7.2	Type																																																																																																										
13.7.3	location																																																																																																										
13.7.4	Model No.																																																																																																										
13.7.5	Length																																																																																																										
13.7.6	Manufacturer																																																																																																										
13.8	INDICATING TYPE DIFFERENTIAL PRESSURE SWITCH (across polishing filter)																																																																																																										
13.8.1	Number																																																																																																										
13.8.2	Type																																																																																																										
13.8.3	Model No.																																																																																																										
13.8.4	No. of contacts & contact rating																																																																																																										
13.8.5	Manufacturer																																																																																																										
13.8.6	List of spares furnished for three (3) Years normal operation and maintenance Enclosed with bid.	Yes/No																																																																																																									
13.8.7	List of special tools furnished enclosed with bid.																																																																																																										
14.0 LT MOTORS(for details refer Annex III)																																																																																																											
14.1	GENERAL																																																																																																										
14.1.1.	Manufacturer & Country of origin.																																																																																																										
14.1.2.	Equipment driven by motor																																																																																																										
14.1.3.	Motor type																																																																																																										
<div style="display: flex; justify-content: space-between;"> <div style="width: 15%;"> COPYRIGHT AND CONFIDENTIAL 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. </div> <div style="width: 85%;"> स्वतंत्रतापूर्वक एवं गोपनीय इस दस्तावेज में दी गई सूचना भारत भारती लिमिटेड का संपत्ति है। इसका प्रयोग एवं प्रसारण अन्य से किसी भी तरह सीधे या अप्रत्यक्ष रूप से किया जाना, अनुमति प्राप्त बिना ग्राहक को न किया जाना। </div> </div>																																																																																																											




SIGN & DATE SIGNATURE	Rev. no. <div style="font-size: 2em; font-weight: bold;">08</div>	निर्माणकर्ता WORKED BY:	Anil / Kavita <div style="font-family: cursive;">Anil Kumar Kavita</div>	18.03.16
		जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh <div style="font-family: cursive;">A. S. Rajput Devesh</div>	18.03.16

दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013																																																																																																													
			पृष्ठ 40 का 27 Page 27 of 40																																																																																																													
SUPERSEDES INVENTORY NO सामग्री सूची नम्बर को अतिरिक्त करता है	<table border="1"> <tr> <td>14.1.4.</td> <td>Quantity</td> <td></td> </tr> <tr> <td>14.2</td> <td>DESIGN AND PERFORMANCE DATA</td> <td></td> </tr> <tr> <td>14.2.1.</td> <td>Frame size</td> <td></td> </tr> <tr> <td>14.2.2.</td> <td>Type of duty</td> <td></td> </tr> <tr> <td>14.2.3.</td> <td>Type of enclosure /Method of cooling/ Degree of protection</td> <td></td> </tr> <tr> <td>14.2.4.</td> <td>Applicable standard to which motor generally conforms</td> <td></td> </tr> <tr> <td>14.2.5.</td> <td>Efficiency class as per IS 12615</td> <td></td> </tr> <tr> <td>14.2.6.</td> <td>(a)Whether motor is flame proof</td> <td>Yes/No</td> </tr> <tr> <td></td> <td>(b)If yes, the gas group to which it conforms as per IS:2148</td> <td></td> </tr> <tr> <td>14.2.7.</td> <td>Type of mounting</td> <td></td> </tr> <tr> <td>14.2.8.</td> <td>Direction of rotation as viewed from DE END</td> <td></td> </tr> <tr> <td>14.2.9.</td> <td>Standard continuous rating at 40 deg C. ambient temp. as per Indian Standard (KW)</td> <td></td> </tr> <tr> <td>14.2.10.</td> <td>Derated rating for specified normal condition i.e. 50 deg. C ambient temperature (KW)</td> <td></td> </tr> <tr> <td>14.2.11.</td> <td>Maximum continuous load demand of driven equipment in KW</td> <td></td> </tr> <tr> <td>14.2.12.</td> <td>Rated Voltage (volts)</td> <td></td> </tr> <tr> <td>14.2.13</td> <td>Permissible variation of :</td> <td></td> </tr> <tr> <td></td> <td>a. Voltage (Volts)</td> <td></td> </tr> <tr> <td></td> <td>b. Frequency (Hz)</td> <td></td> </tr> <tr> <td></td> <td>c. Combined voltage and frequency</td> <td></td> </tr> <tr> <td>14.2.14.</td> <td>Rated speed at rated voltage and frequency(RPM)</td> <td></td> </tr> <tr> <td>14.2.15.</td> <td>At Voltage and frequency:</td> <td></td> </tr> <tr> <td></td> <td>a. Full load current</td> <td></td> </tr> <tr> <td></td> <td>b. No load current</td> <td></td> </tr> <tr> <td>14.2.16.</td> <td>Power Factor at</td> <td></td> </tr> <tr> <td></td> <td>a. 100% load</td> <td></td> </tr> <tr> <td></td> <td>b. NO load</td> <td></td> </tr> <tr> <td></td> <td>c. Starting.</td> <td></td> </tr> <tr> <td>14.2.17.</td> <td>Efficiency at rated voltage and frequency,</td> <td></td> </tr> <tr> <td></td> <td>a.100% load</td> <td></td> </tr> <tr> <td></td> <td>b. 75% load</td> <td></td> </tr> <tr> <td></td> <td>c. 50% load</td> <td></td> </tr> <tr> <td>14.2.18.</td> <td>Starting current (amps) at</td> <td></td> </tr> <tr> <td></td> <td>a. 100 % voltage</td> <td></td> </tr> <tr> <td></td> <td>b. 85% voltage</td> <td></td> </tr> <tr> <td></td> <td>c. 80% voltage</td> <td></td> </tr> <tr> <td>14.2.19.</td> <td>Minimum permissible starting Voltage (Volts)</td> <td></td> </tr> </table>				14.1.4.	Quantity		14.2	DESIGN AND PERFORMANCE DATA		14.2.1.	Frame size		14.2.2.	Type of duty		14.2.3.	Type of enclosure /Method of cooling/ Degree of protection		14.2.4.	Applicable standard to which motor generally conforms		14.2.5.	Efficiency class as per IS 12615		14.2.6.	(a)Whether motor is flame proof	Yes/No		(b)If yes, the gas group to which it conforms as per IS:2148		14.2.7.	Type of mounting		14.2.8.	Direction of rotation as viewed from DE END		14.2.9.	Standard continuous rating at 40 deg C. ambient temp. as per Indian Standard (KW)		14.2.10.	Derated rating for specified normal condition i.e. 50 deg. C ambient temperature (KW)		14.2.11.	Maximum continuous load demand of driven equipment in KW		14.2.12.	Rated Voltage (volts)		14.2.13	Permissible variation of :			a. Voltage (Volts)			b. Frequency (Hz)			c. Combined voltage and frequency		14.2.14.	Rated speed at rated voltage and frequency(RPM)		14.2.15.	At Voltage and frequency:			a. Full load current			b. No load current		14.2.16.	Power Factor at			a. 100% load			b. NO load			c. Starting.		14.2.17.	Efficiency at rated voltage and frequency,			a.100% load			b. 75% load			c. 50% load		14.2.18.	Starting current (amps) at			a. 100 % voltage			b. 85% voltage			c. 80% voltage		14.2.19.	Minimum permissible starting Voltage (Volts)	
14.1.4.	Quantity																																																																																																															
14.2	DESIGN AND PERFORMANCE DATA																																																																																																															
14.2.1.	Frame size																																																																																																															
14.2.2.	Type of duty																																																																																																															
14.2.3.	Type of enclosure /Method of cooling/ Degree of protection																																																																																																															
14.2.4.	Applicable standard to which motor generally conforms																																																																																																															
14.2.5.	Efficiency class as per IS 12615																																																																																																															
14.2.6.	(a)Whether motor is flame proof	Yes/No																																																																																																														
	(b)If yes, the gas group to which it conforms as per IS:2148																																																																																																															
14.2.7.	Type of mounting																																																																																																															
14.2.8.	Direction of rotation as viewed from DE END																																																																																																															
14.2.9.	Standard continuous rating at 40 deg C. ambient temp. as per Indian Standard (KW)																																																																																																															
14.2.10.	Derated rating for specified normal condition i.e. 50 deg. C ambient temperature (KW)																																																																																																															
14.2.11.	Maximum continuous load demand of driven equipment in KW																																																																																																															
14.2.12.	Rated Voltage (volts)																																																																																																															
14.2.13	Permissible variation of :																																																																																																															
	a. Voltage (Volts)																																																																																																															
	b. Frequency (Hz)																																																																																																															
	c. Combined voltage and frequency																																																																																																															
14.2.14.	Rated speed at rated voltage and frequency(RPM)																																																																																																															
14.2.15.	At Voltage and frequency:																																																																																																															
	a. Full load current																																																																																																															
	b. No load current																																																																																																															
14.2.16.	Power Factor at																																																																																																															
	a. 100% load																																																																																																															
	b. NO load																																																																																																															
	c. Starting.																																																																																																															
14.2.17.	Efficiency at rated voltage and frequency,																																																																																																															
	a.100% load																																																																																																															
	b. 75% load																																																																																																															
	c. 50% load																																																																																																															
14.2.18.	Starting current (amps) at																																																																																																															
	a. 100 % voltage																																																																																																															
	b. 85% voltage																																																																																																															
	c. 80% voltage																																																																																																															
14.2.19.	Minimum permissible starting Voltage (Volts)																																																																																																															
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited It must not be used directly or indirectly in any way detrimental to the interest of the company	स्वत्वाधिकार एवं गोपनीय इस दस्तावेज में दी गई सूचना भारत भारती भारतीभारत लिमिटेड की संपत्ति है इसका प्रयोग एवं प्रसारण अन्य से किसी भी तरह प्रयोग को कि कंपनी के हित में हानिकारक हो न किता जाय,																																																																																																															
दिनांक एवं हस्ताक्षर SIGN & DATE 	दिनांक एवं हस्ताक्षर SIGN & DATE 																																																																																																															
सामग्री सूची नम्बर INVENTORY NO 15538	Rev. no. 08	निर्माणकर्ता WORKED BY: Anil / Kavita	जाँचकर्ता CHECKED BY: A. S. Rajput / Devesh	18.03.16 18.03.16																																																																																																												

SIGN & DATE 08/04/16		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013	
			पृष्ठ 40 का 29 Page 29 of 40	
SUPERSEDES INVENTORY NO. 45338	COPYRIGHT AND CONFIDENTIAL 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.	f. Cable glands & lugs details (shall be suitable for power cable)		
		14.3.3. Type of DE/NDE Bearing		
		14.3.4. Motor Paint shade		
		14.3.5. Weight of		
		a. Motor stator (KG)		
		b. Motor Rotor (KG)		
		c. Total weight (KG)		
		14.4 List of accessories.		
		14.4. 1. Space Heaters (Nos./Power in watts/supply voltage)		
		14.4.2. Terminal Box for Space Heater (Yes/No)		
		14.4.3. Speed switch (Yes/No)		
		No of contacts and contact ratings of speed switch		
		14.4.4. Insulation of bearing (Yes/No)		
		14.4.5. Noise reducer(Yes/No)		
		14.4.6. Grounding pads		
		i) No and size on motor body		
		ii) Nos on terminal Box		
		14.4.7. Any other fitments		
		14.5 List of curves.		
		14.5.1 Torque speed characteristic of the motor		
		14.5.2 Thermal withstand characteristic		
		14.5.3 Starting. current Vs. Time		
		14.5.4 Starting. current Vs speed		
		14.5.5 P.F. and Effie. Vs Load		
Note:- Mark N.A. in motor data sheet whichever is not applicable.				
Rev. no. 08	निर्माणकर्ता WORKED BY: Anil / Kavita	जाँचकर्ता CHECKED BY: A. S. Rajput / Devesh	18.03.16	18.03.16

बिहार एवं हरिद्वार SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013																																				
			पृष्ठ 40 का 30																																				
			Page 30 of 40																																				
SUPERSEDES INVENTORY NO. भारती पूर्ण मूल्य को अपडेट करती है	16 ANNEXURE-III (SPECIFICATION OF MOTOR)																																						
<p>1.0 A suitable motor conforming to the purification unit requirement shall be supplied. The motor shall also meet the following requirement broadly. The motor shall confirm to IS : 4722, IS : 325, IS : 2253, IS : 2254, IS : 4029, IS : 3202, IS 12615:2011 & IS : 2148 or equipment BS : Specification. The motor shall meet all Indian statutory requirements.</p>																																							
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:10%;">1.1</td> <td style="width:40%;">Application</td> <td style="width:50%;">To drive feed pump (suction & discharge) and centrifuge</td> </tr> <tr> <td>1.2</td> <td>Type of Motor</td> <td>Squirrel cage, induction motor</td> </tr> <tr> <td>1.3</td> <td>KW Rating at 500 ambient temp</td> <td>It shall have at least 10-15% reserve capacity than required for drive the unit when it is discharging max. quantity at max. viscosity</td> </tr> <tr> <td>1.4</td> <td>KW actually required by driven equipment under specified operation/ start-up conditions.</td> <td>Unit capacity</td> </tr> <tr> <td>1.5</td> <td>Min. Voltage required under starting conditions to bring driven equipment up to rated speed.</td> <td>80% rated</td> </tr> <tr> <td>1.6</td> <td>Full load speed</td> <td>It shall be commensurate with pump & centrifuge speed as per design</td> </tr> <tr> <td>1.7</td> <td>Full load current</td> <td>As per design</td> </tr> <tr> <td>1.8</td> <td>Starting current</td> <td>Not to exceed 600% of the rated exclusive of IS tolerance</td> </tr> <tr> <td>1.9</td> <td>Starting Torque</td> <td>1.3 (Min) of rated torque</td> </tr> <tr> <td>1.10</td> <td>Break down torque</td> <td>2.05 times (min) of rated valve.</td> </tr> <tr> <td>1.11</td> <td>Efficiency at full load</td> <td>IE2 AS PER IS 12615:2011</td> </tr> <tr> <td>1.12</td> <td>Power factor at full load</td> <td>0.85 (Min)</td> </tr> </table>				1.1	Application	To drive feed pump (suction & discharge) and centrifuge	1.2	Type of Motor	Squirrel cage, induction motor	1.3	KW Rating at 500 ambient temp	It shall have at least 10-15% reserve capacity than required for drive the unit when it is discharging max. quantity at max. viscosity	1.4	KW actually required by driven equipment under specified operation/ start-up conditions.	Unit capacity	1.5	Min. Voltage required under starting conditions to bring driven equipment up to rated speed.	80% rated	1.6	Full load speed	It shall be commensurate with pump & centrifuge speed as per design	1.7	Full load current	As per design	1.8	Starting current	Not to exceed 600% of the rated exclusive of IS tolerance	1.9	Starting Torque	1.3 (Min) of rated torque	1.10	Break down torque	2.05 times (min) of rated valve.	1.11	Efficiency at full load	IE2 AS PER IS 12615:2011	1.12	Power factor at full load	0.85 (Min)
1.1	Application	To drive feed pump (suction & discharge) and centrifuge																																					
1.2	Type of Motor	Squirrel cage, induction motor																																					
1.3	KW Rating at 500 ambient temp	It shall have at least 10-15% reserve capacity than required for drive the unit when it is discharging max. quantity at max. viscosity																																					
1.4	KW actually required by driven equipment under specified operation/ start-up conditions.	Unit capacity																																					
1.5	Min. Voltage required under starting conditions to bring driven equipment up to rated speed.	80% rated																																					
1.6	Full load speed	It shall be commensurate with pump & centrifuge speed as per design																																					
1.7	Full load current	As per design																																					
1.8	Starting current	Not to exceed 600% of the rated exclusive of IS tolerance																																					
1.9	Starting Torque	1.3 (Min) of rated torque																																					
1.10	Break down torque	2.05 times (min) of rated valve.																																					
1.11	Efficiency at full load	IE2 AS PER IS 12615:2011																																					
1.12	Power factor at full load	0.85 (Min)																																					
<p>1.13 Motor shall be designed to with stand the voltage and torque stresses developed due to difference between the motor residual voltage and incoming supply voltage equal to 150% of the rated motor voltage during fast changeover of buses.</p>																																							
2.0 STARTING DATA																																							
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:10%;">2.1</td> <td style="width:40%;">Starting</td> <td style="width:50%;">Suitable for DOL</td> </tr> <tr> <td>2.2</td> <td>Acceleration time with full load connected.</td> <td>To be furnished by supplier.</td> </tr> <tr> <td>2.3</td> <td>Permissible starting duty cycle, No. of Starts.</td> <td>3-Starts equally spread over an hour. 2-consecutive starts from hot condition without any injurious heating to the winding.</td> </tr> </table>				2.1	Starting	Suitable for DOL	2.2	Acceleration time with full load connected.	To be furnished by supplier.	2.3	Permissible starting duty cycle, No. of Starts.	3-Starts equally spread over an hour. 2-consecutive starts from hot condition without any injurious heating to the winding.																											
2.1	Starting	Suitable for DOL																																					
2.2	Acceleration time with full load connected.	To be furnished by supplier.																																					
2.3	Permissible starting duty cycle, No. of Starts.	3-Starts equally spread over an hour. 2-consecutive starts from hot condition without any injurious heating to the winding.																																					
बिहार एवं हरिद्वार SIGN & DATE भारती पूर्ण मूल्य INVENTORY NO.	Rev. no. 08	निर्माणकर्ता WORKED BY:	Anil / Kavita Anil kumar Kavita	18.03.16																																			
25/38		जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh A.S. Rajput Devesh	18.03.16																																			

निम्न एवं हस्ताक्षर SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013																															
			पृष्ठ 40 का 31 Page 31 of 40																															
सुपरसेड INVENTORY NO. भारतीय प्रौद्योगिकी संस्थान में अधिष्ठापित करना है	<table border="1"> <tr> <td>2.4</td> <td>Overload (% of full load) that can be Carried by motor without impairing Overall performance and period for Which this overload is applicable.</td> <td>Motor shall be capable for running at full load with 80% of rated voltage for 5 minutes and 70% of rated voltage for 1 Sec. Locked rotor with stand time under hot condition at rated voltage shall be at Least 2.5 sec more than starting time</td> </tr> <tr> <td>2.5</td> <td>Location</td> <td>Turbine oil room indoor</td> </tr> <tr> <td>2.6</td> <td>Class of Insulation</td> <td>Class-F, fungus resistant as per IS:3202 with temp rise limited to that of class B.</td> </tr> <tr> <td>2.7</td> <td>Shaft disposition mountings</td> <td>As per Unit's supplier requirement.</td> </tr> <tr> <td>2.8</td> <td>Method of connections driven equipment</td> <td>As per Unit's supplier requirement.</td> </tr> <tr> <td>2.9</td> <td>Direction of rotation and corresponding terminal designation</td> <td>To suit pumps & centrifuge</td> </tr> <tr> <td>2.10</td> <td>Enclosure and ventilation</td> <td>Totally enclosed fan cooled and flame proof IP55.</td> </tr> <tr> <td>2.11</td> <td>Bearing</td> <td>As per supplier's design, min life 30,000 hrs</td> </tr> <tr> <td>2.12</td> <td>Grounding Device</td> <td>Suitable arrangement shall be provided for earthing the motor at two separate and distinct connection points. Design of earthing conductor shall be as per IS: 4722-1992.</td> </tr> <tr> <td>2.13</td> <td>Terminal box</td> <td>Flame proof terminal box to be provided with double compression Cable gland for Al cable Fault level : 45 KA for 0.01 Sec</td> </tr> </table>				2.4	Overload (% of full load) that can be Carried by motor without impairing Overall performance and period for Which this overload is applicable.	Motor shall be capable for running at full load with 80% of rated voltage for 5 minutes and 70% of rated voltage for 1 Sec. Locked rotor with stand time under hot condition at rated voltage shall be at Least 2.5 sec more than starting time	2.5	Location	Turbine oil room indoor	2.6	Class of Insulation	Class-F, fungus resistant as per IS:3202 with temp rise limited to that of class B.	2.7	Shaft disposition mountings	As per Unit's supplier requirement.	2.8	Method of connections driven equipment	As per Unit's supplier requirement.	2.9	Direction of rotation and corresponding terminal designation	To suit pumps & centrifuge	2.10	Enclosure and ventilation	Totally enclosed fan cooled and flame proof IP55.	2.11	Bearing	As per supplier's design, min life 30,000 hrs	2.12	Grounding Device	Suitable arrangement shall be provided for earthing the motor at two separate and distinct connection points. Design of earthing conductor shall be as per IS: 4722-1992.	2.13	Terminal box	Flame proof terminal box to be provided with double compression Cable gland for Al cable Fault level : 45 KA for 0.01 Sec
2.4	Overload (% of full load) that can be Carried by motor without impairing Overall performance and period for Which this overload is applicable.	Motor shall be capable for running at full load with 80% of rated voltage for 5 minutes and 70% of rated voltage for 1 Sec. Locked rotor with stand time under hot condition at rated voltage shall be at Least 2.5 sec more than starting time																																
2.5	Location	Turbine oil room indoor																																
2.6	Class of Insulation	Class-F, fungus resistant as per IS:3202 with temp rise limited to that of class B.																																
2.7	Shaft disposition mountings	As per Unit's supplier requirement.																																
2.8	Method of connections driven equipment	As per Unit's supplier requirement.																																
2.9	Direction of rotation and corresponding terminal designation	To suit pumps & centrifuge																																
2.10	Enclosure and ventilation	Totally enclosed fan cooled and flame proof IP55.																																
2.11	Bearing	As per supplier's design, min life 30,000 hrs																																
2.12	Grounding Device	Suitable arrangement shall be provided for earthing the motor at two separate and distinct connection points. Design of earthing conductor shall be as per IS: 4722-1992.																																
2.13	Terminal box	Flame proof terminal box to be provided with double compression Cable gland for Al cable Fault level : 45 KA for 0.01 Sec																																
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company	3.0 SPECIAL REQUIREMENTS: 3.1 The motor shall be rewound able 3.2 The motor shall have on line greasing facility. 3.3 Motor shall be suitable for working in an environment of oil fumes without any hazard. 3.4 Separate terminal box for space heater (if applicable) to be provided. 3.5 Motor bearings (DE & NDE) shall be sealed type to avoid frequent Re-greasing. 3.6 The motor construction shall be suitable for easy disassembly and reassembly. 3.7 The terminal box shall be suitable for top and bottom entry of cable and shall be suitable for PVC insulated PVC sheathed armoured aluminium cables and shall be capable of being rotated by 180° in steps of 90°. 3.8 Motor vibrations shall be acceptable as per IS: 12075; motor efficiency as per IS 12615:2011 & noise level as per IS: 12065. Also mechanical vibrations shall be under limits as per IS: 10816-2.																																	
स्वयंसेवक एवं गोपनीय यह प्रमाण है कि यह दस्तावेज़ भारत भारी विद्युत यंत्रों की संपत्ति है। इसका प्रयोग एवं प्रसारण अन्य में किसी भी तरह से बिना भारत भारी विद्युत यंत्रों की लिखित अनुमति के नहीं किया जा सकता।	4.0 DOCUMENTS TO BE SUPPLIED WITH DELIVERY WITH EACH UNIT. THESE SHALL BE SUPPLIED IN TWO COPIES & WORKABLE SOFT COPY.																																	
निम्न एवं हस्ताक्षर SIGN & DATE 	Rev. no. 08	निर्माणकर्ता WORKED BY:	Anil / Kavita		10.03.16																													
भारतीय प्रौद्योगिकी संस्थान INVENTORY NO. 2-5538		जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh		10.03.16																													

SIGN & DATE 		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013	
			पृष्ठ 40 का 32 Page 32 of 40	
SUPERSEDES INVENTORY NO. भारतीय मूल मंत्रालय अधिनियमित किया है	<p>4.1 Characteristics: (at 80%, 100% and 110% of rated voltage)</p> <p>4.1.1 Starting current v/s time</p> <p>4.1.2 Torque v/s slip</p> <p>4.1.3 Thermal with stand for HOT and Cold condition.</p> <p>4.2 Type and frame size</p> <p>4.3 Starting time</p> <p>4.3.1 With 100% voltage at terminal</p> <p>4.3.2 With 85% voltage at terminal</p> <p>4.3.3 With 80% voltage at terminal</p> <p>4.4 Safe install time at 110% rated voltage under hot condition.</p> <p>4.5 Power rating requirement w.r.t. pump requirement.</p> <p>4.6 Motor GD²</p> <p>4.7 Total wt. of motor.</p> <p>4.8 Expected life of bearing (but not <30000 hrs.)</p> <p>4.9 Type & size of cable for which gland is provided, in the terminal box.</p> <p>4.10 Type & routine test certificate as per IS: 4722.</p> <p>4.10.1 In addition to cl 4.10, the following tests shall also be carried out</p> <p>i) Degree of protection test as type test</p> <p>ii) 20% over speed test for 2 minutes as routine test.</p> <p>iii) Measurement of variation as routine test as per IS: 12075.</p> <p>5.0 TESTS AT MANUFACTURE'S WORKS OF MOTOR:</p> <p>5.1 Motor after complete assembly shall be subjected to both type and routine tests as per IS: 4722</p> <p>5.2 Additional type test:-</p> <p>5.2.1 Degree of protection test to conform to the specified degree of protection.</p> <p>5.2.2 Measurement of noise level as per IS 12065, motor noise level shall be limited so as to achieve combined pump motor noise level as per clause no. 5(c).</p> <p>5.3 Additional routine test:</p> <p>5.3.1 20% over speed test for 2 minutes.</p> <p>5.3.2 Measurement of vibrations per IS 12075.</p> <p>6.0 CROSS REFERRED STANDARDS:</p> <p>IS:325 , IS:4722, IS:2253, IS:2254, IS:3202, IS:4029, IS:12065, IS:12075, IS:12615:2011</p>			
COPYRIGHT AND CONFIDENTIAL This 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	स्वामित्व अधिकार एवं गोपनीय इस दस्तावेज में दी गई सूचना भारत भारती मशीनफैक्चर लिमिटेड की संपत्ति है। इसका प्रयोग एवं प्रसारण अन्य से किसी भी प्रकार उचित और कि सम्पत्ति के बिना नहीं किया जाये।			
SIGN & DATE 	भारतीय मूल मंत्रालय अधिनियमित किया है			
INVENTORY NO. P.5531	Rev. no. 08	निर्माणकर्ता WORKED BY:	Anil / Kavita	Anil Kumar Kavita 18.03.16
		जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh	A. S. Rajput Devesh 18.03.16

SIGNATURE SIGN & DATE SUPERSEDES INVENTORY NO भारतीय प्रौद्योगिकी संस्थान भारतीय प्रौद्योगिकी संस्थान		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013
			पृष्ठ 40 का 33
			Page 33 of 40

17 ANEXURE-IV (SPECIFICATION OF INSTRUMENTS)

1) PRESSURE GAUGE

The Pressure gauge should confirm to the following technical specification:-

- The sensing element shall be SS-316 bourdon tube.
- The dial size shall be approx. 150 mm diameter.
- The casing shall be epoxy coated die-cast aluminium with threaded bezel ring.
- The movement shall be stainless steel rotary gear with nylon bearings.
- The process connection shall be G1/2"
- The over range protection should be 150% of max. range
- The pointer shall be micrometer adjustable with zero facility on front.
- The accuracy shall be 1% of full scale.
- The gauge is to be provided with pulsation dampeners.

2) TEMPERATURE INDICATOR

Type	Bimetallic rigid system type. No use of mercury or any other hazardous/toxic material
Case	Die cast aluminium alloy moisture proof case, heavily enamelled black
Dial Size	100 mm
Range	As per design
Accuracy	1% of total range
Bulb Material	½" bulb diameter made of SS. 316
Thermo-well	SS-AISI316 (with thread size G1/2")
Ambient Temp	60° C max.

3) MAGNETIC LEVEL SWITCH

Process Connection: - Nb25

Material: All parts coming in contact with the liquid made of stainless steel SS316

Electrical characteristics

Switch: Single pole double throw change over switch silver contact for handling the following currents

AC 250V – 5.0A

DC 250V – 0.25A

Operating characteristics


Differential – 6 MM I. e. 3 MM on either side of centre line working pr & Temp. : As per design

Ambient Temp. : 60°C max.


SIGNATURE
SIGN & DATE
08/03/16

भारतीय प्रौद्योगिकी संस्थान INVENTORY NO P-5538	Rev. no.		निर्माणकर्ता WORKED BY:	Anil / Kavita	Anil kumar Kavita	18.03.16
	08		जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh	A. S. Rajput Devesh	18.03.16

St. Pauli 18.03.16

SIGNATURE SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013		
			पृष्ठ 40 का 36 Page 36 of 40		
SUPERSEDES INVENTORY NO.	20 ANNEXURE- VII (CHECK LIST) A. CHECK LIST FOR MECHANICAL ITEMS				
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited It must not be used directly or indirectly in any way detrimental to the interest of the company	Sl. No.	Technical Requirements	Vendor's confirmation (Yes/No)	Remarks (if any)	
	1.	Is capacity of oil purifier as per BHEL specifications (i.e. 7500 LPH)?			
	2.	a) Is particle size of impurities in the clean oil as per BHEL specifications in single pass (i.e. class 15/12 or better as per ISO4406)? b) Is moisture content in the clean oil as per BHEL specifications in single pass (i.e. ≤ 500 ppm)?			
	3.	Is the test certificate for particle size of impurities & moisture content provided as per BHEL specification?			
	4.	Is mode of operation (i.e. purifier/clarifier) as per BHEL specifications & enquiry?			
	5.	Is noise level as per BHEL specifications?			
	6.	Is overflow sight fitting provided as per BHEL specifications?			
	7.	Is capacity of oil feed & discharge Pump (i.e. at least 10% higher than capacity of the purifier) as per BHEL specifications?			
	8.	a) Is copies of O&M manual (CD based & hard paper based) provided as per BHEL specifications? b) Are 2 copies (hard paper based) of O & M manuals kept inside the dispatch box as per BHEL specifications & enquiry?			
	9.	Is polishing filter ($\beta_3 = 1000$ or better) provided as per BHEL specifications?			
	10.	Is supervision during erection & commissioning at site by vendor offered as per BHEL specifications & enquiry?			
	11.	Is lube oil recirculation piping/ piping connection provided as per BHEL specifications & enquiry?			
	12.	Are sufficient spares for satisfactory commissioning and for 3 years satisfactory operation of the purifier provided as per BHEL specifications?			
	13.	Are detailed lists of recommended spares and commissioning spares along with price break up provided as per BHEL specifications & enquiry?			
14.	Is separate offer for conducting test for particle size of impurities and				
SIGNATURE SIGN & DATE 18/03/16	Rev. no.		निर्माणकर्ता WORKED BY:	Anil / Kavita	Anil Kumar 18.03.16
सामग्री सूची संख्या INVENTORY NO. P-5538			जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh	Devesh 18.03.16

[illegible]

दिनांक एवं हस्ताक्षर SIGN & DATE भारतीय नौवहन विभाग INVENTORY NO. २५३७८		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013	
			पृष्ठ 40 का 38 Page 38 of 40	
B. CHECK LIST FOR C&I ITEMS				
Check list for OPU (DCS Based)				
1. OPU is DCS Based with provision of operating from local controls panel as well control room; yes/ no 2. Plug and socket type connection for all pressure switch and level switch : yes/no 3. DCS/Local selector switch is provided on the Local control panel: yes/no 4. Relays shall be of 24 v dc and of vendor scope of supply: yes/no 5. List of drives to be operated through DCS is furnished along with list of instruments and alarms.: yes/no 6. All field instruments shall be wired to a JB which shall be in vendor scope.: yes/no 7. A pressure switch at outlet of centrifuge and a level switch in anti-flood tank shall be provided for detection of liquid seal breakage. 8. Arrangement for Liquid seal breakage alarm is provided : yes/no 9. Air requirement of pneumatic valves is mentioned: yes/no 10. Motor efficiency meeting as per special instruction/project requirement : yes./no 11. Control panel is designed for 3 phase (415 v Ac) 3 wire power supply system: yes/no 12. Control panel is provided with anti-vibration pads to withstand vibrations: yes/no. 13. Motor data sheet shall be subject to customer/ BHEL approval: yes/no 14. Cable glands for 415 V AC incomer is provided : yes/no 15. On/Off control, indication and alarms is provided in local panel as well as HMI: yes/no 16. Painting treatment as per addendum or special instruction mentioned in indent: yes/no. 17. Construction of panel as per specification/addendum: yes/no. 18. Price break of spare item/spare of LS switchgear given along with offer: yes/no 19. 20% spare terminals have been provided at panel: yes/no.				
भारतीय नौवहन विभाग INVENTORY NO. २५३७८	Rev. no. ०८	निर्माणकर्ता WORKED BY: Anil / Kavita	Anil Kumar Kavita	18.03.16
भारतीय नौवहन विभाग INVENTORY NO. २५३७८		जाँचकर्ता CHECKED BY: A. S. Rajput / Devesh	Anil Kumar Devesh	18.03.16



उत्पाद क्रय विनिर्देश (हीप : हरिद्वार)
PRODUCT PURCHASE SPECIFICATION
(HEEP: HARIDWAR)

ST39013

पृष्ठ 40 का 39

Page | 39 of 40

20. All instrument as well as motor data sheet, wiring diagram write up is subject to BHEL/customer approval: yes/no
21. panel to be designed for 110 V AC control voltage : yes/no
22. For panel color exterior -Opaline green semi glossy finish, interior-glossy white and motor-smoke grey yes/no
23. All HT & LT motors shall be energy efficient type with efficiency class 1: yes/no

Date:
Place:

Signature
Seal of manufacturer

COPYRIGHT AND CONFIDENTIAL

The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company

स्वाधिकार एवं गोपनीय

इस दस्तावेज में दी गई सूचना भारत भारी यंत्रोद्योग निगम की संपत्ति है। इसका प्रयोग एवं प्रकाश अन्य से किसी भी प्रकार का उपयोग जो कि कंपनी के हित में हानिकारक हो न किया जाए।

हस्ताक्षर एवं तिथि
SIGN & DATE

सामग्री सूची संख्या
INVENTORY
NO.

Rev. no.

निर्माणकर्ता
WORKED BY:

Anil / Kavita

Anil kumar
Kavita


18.03.16

जाँचकर्ता
CHECKED BY:

A. S. Rajput /
Devesh

Ajay Kumar
Devesh

18.03.16

दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013 पृष्ठ 40 का 40 Page 40 of 40
सुपरसेड्स INVENTORY NO.	<p align="center"><u>Check list for OPU (Relay Based)</u></p> <ol style="list-style-type: none"> Oil Purification Unit is relay based: yes/no On/Off control, indication and alarms is provided in local panel: yes/no Control panel is designed for 3 phase (415 v Ac) 3 wire incomer power supply system: yes/no Motor efficiency meeting as per special instruction/project requirement : yes /no Air requirement of pneumatic valves is mentioned: yes/no. A pressure switch at outlet of centrifuge and a level switch in anti-flood tank is provided for detection of liquid seal breakage: yes/no Cable glands for 415 V AC incomer is provided : yes/no Adequately sized copper ground bus is provided for each panel: yes/no Painting treatment as per addendum or special instruction mentioned in indent: yes/no Paint shade of control panel as per addendum/special requirement: yes/no Construction of panel as per specification/addendum: yes/no Control panel is provided with anti-vibration pads to withstand vibrations: yes/no. Plug and socket type connection for all instruments : yes/no Arrangement for Liquid seal breakage alarm is provided: yes/no Price break of spare item/spare of LS switchgear given along with offer: yes/no Motor data sheet shall be subject to customer/ BHEL approval: yes/no 20% spare terminals have been provided at panel: yes/no All instruments shall be of reputed make. 		
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.			
स्वामित्व अधिकार एवं गोपनीयता यह दस्तावेज कंपनी की संपत्ति है। इसमें उल्लेखित जानकारी के बिना किसी भी प्रकार का उपयोग नहीं किया जा सकता है।			
दिनांक एवं हस्ताक्षर SIGN & DATE	Date: &Place:		
भारतीय मूल्य संज्ञा INVENTORY NO.	निर्माणकर्ता WORKED BY: Anil / Kavita जाँचकर्ता CHECKED BY: A. S. Rajput / Devesh		
	18.03.16 18.03.16		