

**Buyers Specific Additional Terms & Conditions**  
**Item Name: DPS of Duplex Filter (LO) as per Var-06, ST46056**

**Projects: DVC Mejia Project**

1. **Scope of Enquiry**

E-bids on GeM portal are invited from bidders for the supply of **DPS of Duplex Filter (LO)** as below description for Mejia Project, as per requirement mentioned below:

Sl. No.	Material Code & Item Description	Total Quantity	Date for Supply Completion
1	<b>Mat Code: W90318103249</b> DPS of DUPLEX FILTER (LO) AS per VAR 06 , ST46056 Rev-03 (MODEL No. 4.36.2.3 Range 0-1.2 Kg/cm2, Make: BOLL & KIRCH FILTERBAU (BOLLFILTER)	1 No.	With in 30 days of PO

2. **Consignee Details:**

**OFFICE OF THE STORE IN CHARGE,  
CENTRAL STORE DVC, P.O. MTPS,  
DIST. BANKURA  
PIN-722183, STATE : West Bengal-19  
GST No : 19AABCD0541M1ZO**

3. **EARNEST MONEY DEPOSIT (EMD): NIL**

**Annexure A: Buyers Specific Additional Terms & Conditions in addition to GTC**

Sl. NO.	Terms	Description	Your confirmation
1.	<b>Confirmation to compliance of GTC on GeM 4.0 (Version 1.23)</b>	General terms and conditions on <b>GeM 4.0 (Version 1.23)</b> or subsequent rules/policies issued by GeM shall be applicable. <b>Please confirm.</b>	
2.	<b>Public Procurement (Preference to Make in India)</b>	Not Applicable	
3.	<b>Pre-Qualification Requirements (PQR)</b>	The Pre-Qualification Requirements have been compiled and submit filled copy of Table and supporting PO copy, customer acceptance etc. 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.	
4.	<b>Special Instruction of Technical requirement</b>	1. DPS shall be of MODEL No. 4.36.2.3 Range 0-1.2 Kg/cm2 2. Make: BOLL & KIRCH FILTERBAU (BOLLFILTER)	
5.	<b>Quality Requirements</b>	Bidder to confirm to provide OEM standard test certificate/ documents along with material.	
6.	<b>Price basis, Evaluation Currency, Firm prices &amp; Transit Insurance</b>	Prices should be quoted on F.O.R. Destination up to Mejia Project basis i.e. including freight, packing & forwarding charges, GST etc.  <b>The evaluation currency for this tender shall be INR.</b>  <b>Price will remain firm and fixed during entire execution of tender/supply.</b> <b>Transit insurance shall be arranged by BHEL and not to be included in the prices.</b>	
7.	<b>Consignee Address Declaration</b>	Consignee mentioned in GeM enquiry may be different. However, material to be dispatched to following consignee address:  <b>OFFICE OF THE STORE IN CHARGE, CENTRAL STORE DVC, P.O. MTPS,  DIST. BANKURA, PIN-722183, STATE : West Bengal-19</b>	

8.	<b>Evaluation criteria</b>	Evaluation will be done on the basis of total landed cost to BHEL, with cost involved for delivery up to DVC MEJIA project site (considering material cost, taxes & duties, Freight etc.	
9.	<b>Payment Terms</b>	Payments shall be made to the Seller within 90 days of issue of consignee receipt-cum-acceptance certificate (CRAC) and on-line submission of bills. For Micro/ small & Medium (covered under MSME Act), payment will be made within 45 days & 60 days respectively after on-line submission of bills and issue of consignee receipt-cum-acceptance certificate (CRAC).	
10.	<b>Delivery Period</b>	Kindly quote your minimum delivery period after PO placement or BHEL clearance.....	
11.	<b>MDCC clause</b>	Material shall be dispatched only after issue of material dispatch clearance certificate (MDCC) by BHEL. All test certificates and relevant documents are to be sent to BHEL before dispatch of material for issue of MDCC, which will be issued after review of test certificates etc. MDCC will be issued within 07 days of receipt of these documents once found complete in all respects. In case of any delay on account of BHEL in issuing MDCC, delivery shall be extended by no. of days in excess of 7 days taken by BHEL in issuing MDCC and delays shall be dealt on merit basis.  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.  Material is to be dispatched within 07 days of receipt of MDCC from BHEL without waiting for PO amendment.	
12.	<b>Guarantee</b>	Kindly confirm that equipment shall be guaranteed for trouble free & satisfactory operation for minimum period of 18 months from the date of dispatch. Please note that offers with guarantee period lesser than above mentioned guarantee period may result in rejection of the offer.	
13.	<b>Dispatch Instruction</b>	Material should be packed properly in Green Box and proper labeling like Description, PO etc. should be marked on Box.	
14.	<b>Liquidated Damages</b>	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 dispatch mentioned on LR/GR would be treated as the date of delivery for penalty purposes.	
15.	<b>Settlement of Dispute, CONCILIATION &amp; ARBITRATION:</b>	<b>Settlement of Dispute</b> 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.  <b>CONCILIATION:</b> 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 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). Note: Ministry of Finance has issued OM reference No. 1/2/24 dated 03.06.2024 regarding "Guidelines for Arbitration and Mediation in Contracts of Domestic Public Procurement. In the said OM it has been recommended that Government departments/ Entities/agencies are to encourage mediation under the Mediation Act. 2023. The said Act has not yet been notified by the Government. Therefore, the clause "Settlement of Disputes" shall be modified accordingly as and when the Mediation Act 2023 gets notified.  <b>ARBITRATION:</b>	

		<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 &amp; 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 &amp; 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 dispute shall be adjudicated by the court of competent jurisdiction.</p>	
16.	<b>BREACH OF CONTRACT, REMEDIES AND TERMINATION:</b>	<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</p>	

		<p>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><b>Remedies in case of Breach of Contract.</b></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 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>	
17.	<b>Suspension of Business</b>	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	

	<b>Dealings with Suppliers / Contractors:</b>	available on BHEL web site www.bhel.com. 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: <a href="http://www.bhel.com/vender_registration/vender.php">http://www.bhel.com/vender_registration/vender.php</a> .													
18.	<b>CONFLICT OF INTEREST AMONG BIDDERS/ AGENTS</b>	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: a) they have controlling partner (s) in common; or b) they receive or have received any direct or indirect subsidy/ financial stake from any of them; or c) they have the same legal representative/agent for purposes of this bid; or d) 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 e) 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 f) 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 authorise 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 g) 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 h) 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. "													
19.	<b>MICRO AND SMALL ENTERPRISES (MSE):</b>	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. <table border="1" data-bbox="467 1245 1297 1394"> <tr> <th>Type under MSE</th><th>SC/ST owned</th><th>Women owned</th><th>Others (excluding SC/ ST &amp; 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. 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 &amp; 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															
20.	<b>JURISDICTION:</b>	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.													
21.	<b>Force Majeure</b>	"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,													

		<p>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, go slow 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>	
22.	<b>Cartel Formation</b>	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.	
23.	<b>Fraud Prevention Policy:</b>	Bidder along with its associate /collaborators /sub-contractors /sub-vendors / consultants / service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website <a href="http://www.bhel.com">http://www.bhel.com</a> and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice.	
24.	<b>Order of Precedence:</b>	<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"> <li>Amendments/Clarifications/Corrigenda/Errata etc. issued in respect of the tender documents by BHEL.</li> <li>Buyer Added Bid Specific ATC</li> <li>GeM Bid Technical Conditions of Contract (TCC)</li> <li>GeM GTC</li> </ol>	
25.	<b>BID to RA</b>	Applicable as per GeM NIT	
26.	<b>Contact details</b>	<p>Please provide 2 Nos of contact details (email id and contact no.) for clarifications.</p> <p>1.....</p> <p>2.....</p>	

**Note: Please fill your acceptance/ comments in confirmation column. Blank column shall be considered as accepted by bidder without any deviation.**

**PRE-QUALIFICATION REQUIREMENTS FOR DIFFERENTIAL PRESSURE SWITCH**  
**(Material Code - W90318103249)**

1. Vendor to submit experience-list<sup>\$</sup> (manufacturing/supplying/ testing/ support after sales) for supply of Differential Pressure ~~Gauge~~<sup>Switch</sup> of BOLL & KIRCH FILTERBAU (BOLLFILTER) make for continuous operation as per details outlined below:-

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

- a) Supply of at least 5 items in last 5 (Five) years.
- 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. The party shall have necessary arrangement/tie-up for providing services after sales for providing necessary assistance to BHEL, in case of any requirement. Bidder to confirm.
4. 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.

*Suresh*  
01/03/25  
Sh. Suresh Chandra  
SDGM/CIE

*Sunil*  
01/03/25  
Sunil Kumar Gautam  
Dy. Manager/CIE





उत्पाद मानक

# STEAM TURBINE ENGINEERING PRODUCT STANDARD

ST46056

पृष्ठ का

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## TECHNICAL SPECIFICATION OF DUPLEX OIL FILTER

**1.0 INTENT OF SPECIFICATION :-** The specification is intended to cover design, manufacturing, assembly, testing and supply of Duplex filter complete with commissioning spares(including one set of filter element and one set of all seal gaskets), special tools & tackles & differential pressure switch cum indicator(as per specification given in Annexure-1). The duplex filter is intended for operation in conjunction with Steam Turbines and should be suitable for operation at an ambient temperature of 60°C & 95% humidity.

**2.0 FUNCTION :-** One side of duplex filter comes in operation with the start of any one of the lubricating oil pumps and remains in service as long as any one of the lubricating oil pump runs. The other side of the duplex filter remains as a stand-by and is brought into operation when the running side gets saturated with dirt and other contaminants which is reflected by the differential pressure read across the inlet and outlet of filter.

The stand by filter is kept in primed condition to facilitate the immediate change over. The change over device must prevent both the filters being off at the same time. The change over should be possible by the operation of single hand wheel.

**3.0 OIL SPECIFICATION :-** The specification of oil to be filtered complies with IS : 1012 or ISO VG 46. The equivalent grades of various oil suppliers are servoprime 46 of M/s Indian Oil Corporation and Turbinol – 47 of M/s Hindustan Petroleum Corporation.

Kinematic viscosity at 50°C : 28 CS  
Specific gravity at 50°C : 0.852  
Flash point : 200°C (Min.)  
Operational temperature : 40°C  
Pour point : -6.0°C (Max.)

**3.1 COMPLIANCE WITH NATIONAL STANDARD** ——— **NIL** ———

**4.0 FILTER DATA :-**

Type : Duplex  
Inlet/Outlet Nozzles : Flanged


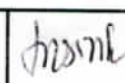
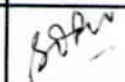
Variant no.	01	02	03	04	05	06	07	08
Capacity (M <sup>3</sup> /hr)	40	130	250	7	60	170	6	130
Nozzle size Nb(mm)	100	125	200	25	125	150	25	150
Design Pr. (Kg/cm <sup>3</sup> )	12			250	12		250	12


Design Temperature : 50° C  
Actual pressure drop cleaned condition : 4000 mm wc(Including change over valve)  
Actual pressure drop saturated condition : 12000 mm wc for var. 01 to 06 and 08  
42000 mm wc for var. 04 and 07  
Quality of filtration : 37 micron

हस्ताक्षर एवं दिनांक SIGN & DATE	नाम NAME	दिनांक एवं हस्ताक्षर SIGNATURE & DATE
MEMBER PSC	R PANJA	13-8-07
QAX	N K Mahwani	15-03-2012
TSX	V.K. CHAUHAN	15-03-2012
सहमत विभाग AGREED DEPTT.	नाम NAME	दिनांक एवं हस्ताक्षर DATE & SIGNATURE
अनुवादक TRANSLATED BY	निर्माणकर्ता WORKED BY	जांचकर्ता CHECKED BY
पर्यवेक्षणकर्ता SUPERVISED BY	स्वीकृति APPROVED : A.K. JAIN	जारी ISSUED : STE (TL)
Reaffirm 2022	REV. NO. 03 Dt 30.10.09	15-03-2012
जांचकर्ता CHECKED BY	निर्माण PREPARED : STE	दिनांक DATE : 02.02.1993


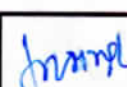
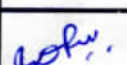
CA-STE-22-17




निर्देश: इस प्रमाणित SIGN & DATE		<b>उत्पाद मानक</b> <b>STEAM TURBINE ENGINEERING</b> <b>PRODUCT STANDARD</b>		ST46056																																						
				पृष्ठ का Page 02 of 07																																						
SUPERSEDES INVENTORY NO	<b>5.0 DESIGN, MATERIAL &amp; CONSTRUCTION OF FILTER :-</b>																																									
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.	<table border="1"> <tr> <td>a) Filter element</td> <td colspan="5">           : Wire cloth of 25 micron to 40 micron            : Material Stainless Steel            : Pleated type filter Elements are not acceptable            : Elements shall be cleanable type for reuse.         </td> </tr> <tr> <td>b) Filter body</td> <td colspan="5">           : Seamless pipe ASTM A 106 Gr. B or equivalent for var. 01, 02, 03, 05, 06, 08 and ASTM A 105 or equivalent for var. 04 &amp; 07.         </td> </tr> <tr> <td>c) Change over Valve</td> <td>Type</td> <td colspan="4">Ball valve</td> </tr> <tr> <td></td> <td>Body Material</td> <td colspan="4">ASTM 216 Gr. B or equivalent</td> </tr> <tr> <td></td> <td></td> <td>Internals</td> <td colspan="4">Stainless Steel</td> </tr> <tr> <td>d) Sealings</td> <td colspan="5">: VITON</td> </tr> </table>					a) Filter element	: Wire cloth of 25 micron to 40 micron : Material Stainless Steel : Pleated type filter Elements are not acceptable : Elements shall be cleanable type for reuse.					b) Filter body	: Seamless pipe ASTM A 106 Gr. B or equivalent for var. 01, 02, 03, 05, 06, 08 and ASTM A 105 or equivalent for var. 04 & 07.					c) Change over Valve	Type	Ball valve					Body Material	ASTM 216 Gr. B or equivalent						Internals	Stainless Steel				d) Sealings	: VITON				
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		Internals	Stainless Steel																																							
d) Sealings	: VITON																																									
<p>Materials of other components shall be selected by the bidder. The materials of construction of filter shall be such as to resist corrosion &amp; erosion and shall give a long trouble free service. No cast iron components shall be acceptable. BHEL/owner reserves the right to ask for changes in material.</p> <p>At suitable points on filter, lifting lugs shall be provided for ease of transportation &amp; erection. Their locations must be shown on the dimensional drawings.</p> <p>Each side of the filter shall be provided with a vent connection suitable for pipe thread R1/4" and a drain connection suitable for pipe thread R1/2" for var. 01, 04 &amp; 07 and R1" for var. 02, 03, 05, 06 &amp; 08. Vent connections should necessarily be provided on the sides of each filter chamber top flange to facilitate removal of filter cover for cleaning / maintenance without removal of vent piping connected to this connection.</p> <p>Priming line with a valve shall be provided between two filter chambers. The filter as per var. 01, 02, 03, 05, 06, 08 is envisaged to be mounted in a tray and the distance between legs of filter shall be above inlet connection. Other dimensions shown in the sketch are binding.</p> <p>The filter as per var. 04 &amp; 07 shall be provided with suitable arrangement to support it with Main Oil Tank /steel structure.</p>																																										
<b>6.0 QUALITY ASSURANCE, INSPECTION AND TESTINGS :</b>																																										
6.1 The bidder shall submit quality plan along with his offer format for BHEL/Owner's approval. 6.2 The particulars of the proposed shop tests and procedures for the tests shall be submitted to BHEL/Owner for approval along with Quality Plan. 6.3 The filter shall be dispatched only after inspection, approval of test certificates and clearance from BHEL/Owner. 6.4 Wherever welding is involved, it is to be carried out by qualified welders and weld procedures are to be qualified as per ASME code section-IX. 6.5 The minimum tests/checks to be carried out on the Duplex Oil Filter are given below. BHEL/Owner reserves the right to ask for any more checks at the time of Quality Plan finalisation.																																										
6.5.1 <u>Testing of materials:</u> The material of body, spindle, disc seat, filter elements etc. shall be tested as per relevant standard for its chemical composition, mechanical properties viz. YS, UTS, impact, %age elongation, reduction in areas etc and NDT. The test certificates for all the tests indicating actual test results should be furnished. Supplier shall give the type and details of NDT to be carried out along with the offer. Material certificate of conformance & acceptable in case of M/s hydac & M/s EPE & BOLL & KIRCH. # Ductile cast iron (EN-GJS-400-18)																																										
निर्देश: इस प्रमाणित SIGN & DATE P-5136	REV. NO. 03	निर्माणकर्ता WORKED BY M.SINGH			31/7/07																																					
		जांचकर्ता CHECKED BY SDR			31/7/07																																					

डिजाइन एंटरप्राइस SIGN & DATE		उत्पाद मानक  <b>STEAM TURBINE ENGINEERING PRODUCT STANDARD</b>		ST46056	
				पृष्ठ का  Page 03 of 07	
SUPERSEDES INVENTORY NO	6.5.2 All butt welds shall be subjected to 10% RT and all fillet welds to 100% MPI. All welding shall be carried out by qualified procedures and welders.				
मॉडिफाई एंटरप्राइस अधिकृत संकेत	6.5.3 Following tests shall be carried out during various stages of manufacturing at bidder's works :-				
COPYRIGHT AND CONFIDENTIAL  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.	a) Check for dimensions of all the component. b) <u>Hydraulic Test</u> : The body of filters shall be tested at one and half times the design Pressure in fully assembled condition for 5 mts. c) <u>Seat leakage test</u> : It shall be carried out at the design pressure for 5 minutes. Acceptance norms shall be nil leakage. d) <u>Functional Test</u> : It shall demonstrate smooth operation of change over valve. e) <u>Verification of mesh size of element</u> : By recognised lab. f) <u>Collapsibility Test</u> : A type test at a differential pressure of 5.0 kg/cm <sup>2</sup> for var 01,02,03,05,06 & 160.0 kg/cm <sup>2</sup> for variant 04 & 07. This test shall be conducted as per ISO : 2941. g) <u>Pressure Drop Test</u> : As per ISO 3968. The pressure drop in clean condition should not exceed 0.4kg/cm <sup>2</sup> including change over valve. This is type test.				
	7.0 <u>DOCUMENTS:</u>				
स्वत्वधिकार एवं गोपनीय  इस दस्तावेज में सभी अधिकार भारत भारी विद्युत इंजीनियरिंग लिमिटेड के पास हैं। इस दस्तावेज को बिना लिखित अनुमति के किसी भी व्यक्ति को प्रसारित नहीं किया जा सकता है।	A. <u>Along with offer</u> : i) Detailed catalogue with electrical contact rating. ii) Assembly drawing with part lists, material of each part, nozzle sizes & their coordinates, leg spacing, cross sectional arrangement incorporating overall dimensions. iii) Pressure loss curve for normal flow at different flow areas. iv) Details of priming connection, change over valve, differential pressure switch, flow direction indicator, etc. v) Quality plan. vi) Testing procedures. vii) List of commissioning spares which will include one set of all type of seals/gaskets & one filter element. viii) List of spares for 5 years of operation. ix) List of special erection/maintenance tools. x) Type test certificate for collapsibility test and pressure drop test shall be submitted along with the offer.				
	B. <u>After Placement of order</u> i) Documents listed at 7.0(A) above (for approval) 4 weeks ii) O & M instructions 12 weeks iii) Instruction on conservation and deconservation. 12 weeks				
प्रमाणित किया गया SIGN & DATE	No. of copies shall be specified at the time of ordering. However if not specified, 10 copies shall be furnished by the bidder.				
INVENTORY NO	C. <u>Along with Dispatch</u> i) Detailed catalogue ii) Calibration & test certificates iii) Guarantee certificate iv) Type test certificate for degree of protection				
REV. NO.  03	निमाणांक WORKED BY MSINGH		31/7/07		
P-5136	जांचकर्ता CHECKED BY SDR		31/7/07		



दिनांक एवं हस्ताक्षर SIGN & DATE		<b>उत्पाद मानक</b>  <b>STEAM TURBINE ENGINEERING PRODUCT STANDARD</b>	<b>ST46056</b>  पृष्ठ का  <b>Page 04 of 07</b>								
SUPERSEDES INVENTORY NO.  सामग्री सूची संख्या को अधिकृतित करता है	<b>8.0 IDENTIFICATION :</b> The name plate of filter shall have following information <div style="margin-left: 40px;">           i) Type/Designation : Duplex filter            ii) Tag no.           <table border="1" style="margin-left: 100px; border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 5px;">Var.</td> <td style="padding: 5px;">01 &amp; 05</td> <td style="padding: 5px;">02,03,06&amp;08</td> <td style="padding: 5px;">04 &amp; 07</td> </tr> <tr> <td style="padding: 5px;">Tag no.</td> <td style="padding: 5px;">MAV43 BT001</td> <td style="padding: 5px;">MAV42 BT001</td> <td style="padding: 5px;">MAV35 BT001</td> </tr> </table> </div> <div style="margin-left: 40px;">           iii) Nominal size of inlet / outlet nozzles            iv) Press loss (in cleaned condition)            v) Manufacturer's name            vi) Medium            vii) Purchase order no.            viii) Month &amp; year of manufacture         </div>			Var.	01 & 05	02,03,06&08	04 & 07	Tag no.	MAV43 BT001	MAV42 BT001	MAV35 BT001
Var.	01 & 05	02,03,06&08	04 & 07								
Tag no.	MAV43 BT001	MAV42 BT001	MAV35 BT001								
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	<b>9.0 CLEANING, PAINTING, CONSERVATION &amp; PACKING :</b> The bidder shall give exact and precise details about the measures envisaged by him for surface protection. Painting of interior surface coming in contact with oil is prohibited. After testing of filter 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. Filter shall be suitably packed for transportation. Instruction should be issued regarding reconsevation, deconsevation and storage of package										
स्वत्वाधिकार एवं गोपनीय  इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रस्ताव एवं अप्रस्ताव को किसी भी तरह प्रयोग, जो कि कानूनी को हित में प्राधिकारक हो न किया जाए ।	<b>10.0 GENERAL :</b> The bidder can make suitable offers even if there are minor deviations which do not effect the efficient functioning of the equipment. However the deviation must be clearly spelt the same along with the offer. The offer may not be considered if all the technical particulars and information called for in the specification are not submitted along with the offer.										
हस्ताक्षर एवं दिनांक SIGN & DATE	<b>11.0 GUARANTEE :</b> <div style="margin-left: 40px;">           i) The supplier shall guarantee trouble free and satisfactory operation of the equipment for a period of 18 months after delivery or 12 months after commissioning whichever is earlier.             ii) The bidder shall guarantee the quality of filtration &amp; pressure loss in cleaned and saturated conditions.             iii) If during erection / commissioning at site and deficiency in parts is detected. BHEL site office shall prepare the assessment report and copy of the same shall be forwarded to the bidder. The bidder shall replace / rectify the concerned items free of charge. The bidder if he so desires may depute his representative to site at his own cost with in one week after receipt of the above report, shall be final &amp; binding on bidder of Duplex filter.         </div>										
सामग्री सूची संख्या INVENTORY NO.	REV. NO.  03	<b>12.0 DESPATCH :</b> The equipment along with all accessories shall be dispatched to a destination to be specified after the placement of order.									
P-5136		निर्माणकर्ता WORKED BY  जांचकर्ता CHECKED BY	M.SINGH  SDR  <div style="display: flex; justify-content: space-between;"> <div>  31/7/07   31/7/07         </div> </div>								

ST46056 पृष्ठ का Page 05 of 07		उत्पाद मानक STEAM TURBINE ENGINEERING PRODUCT STANDARD				दिनांक एवं हस्ताक्षर SIGN & DATE
SUPERSEDES INVENTORY NO. सामग्री सूची संख्या को अधिकारिता करता है		ANNEXURE-1 <b><u>DIFFERENTIAL PRESSURE SWITCH CUM INDICATOR :</u></b>				
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		1.0 The differential pressure switch shall consist of a calibrated indicator for indicating the differential pressure across each filter basket. Switch with electrical contacts shall be actuated when the differential pressure reaches preset value. 2.0 The differential pressure switch shall be suitable for Ambient temperature : 0-60°C and Relative humidity : 95% 3.0 <b>Housing :</b> Body material : Die cast aluminum alloy or stainless steel Degree of protection : IP 65 External surface : Finished with staving enamel 4.0 Sensing element type : Diaphragm/piston 5.0 Material of sensing element and other parts : Stainless steel AISI 304 or equivalent in contact with the service medium 6.0 Differential pressure range : 0-1.2 kg/cm <sup>2</sup> for var. 01,02,03,05,06 & 08 0-6 kg/cm <sup>2</sup> for var. 04 & 07 7.0 Max. static pressure : one and half times design pressure 8.0 <b>Set point adjustment :</b> The switching point shall be adjusted to operate at 0.9 kg/cm <sup>2</sup> in pressure increasing direction for var. 01, 02, 03, 05, 06 & 08 .for var. 04 & 07 the switching shall be set at 4.2 kg/cm <sup>2</sup> . However, the set point for variants shall be adjustable over the specified differential pressure range. There shall be proper facility with suitable lockable arrangement for set point adjustment. 8.1 Switching repeatability : ± 1% of differential pressure range 8.2 Accuracy : Equal or better than ± 2% at mid 50% of differential pressure range 9.0 <b>Electrical contact :</b> Contact type : Snap action micro switch / Reed contact Contact material : Silver plated Contact rating : 0.25A / 120 V AC, 3W/ DC No. of Contact s : 1 No. change over type i. e. 1 SPDT Contact life : approx. (10) <sup>6</sup> switching cycles. 10.0 <b>Electrical connection :</b> Cable entry shall be provided with cable gland complete with neoprene grommet. Terminals shall be suitable for cable termination of 0.5 mm <sup>2</sup> cable core cross section. 11.0 <b>Identification Tag :</b> In addition to the instrument name plate, one separate stainless steel tag punched with tag no. MAV 43 CP 011 for variants 01 & 05, MAV 42 CP 013 for var. 02, 03, 06 & 08 and MAV 35 CP 016 for var. 04 & 07 shall be fastened with the switch, if not possible to engrave on instrument name plate.				
स्वत्वाधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रयोग एवं प्रसारण के बिना भारत हेवी इलेक्ट्रिकल्स की लिमिटेड की स्वीकृति के बिना नहीं किया जायेगा		दिनांक एवं हस्ताक्षर SIGN & DATE 31/8/07				
INVENTORY NO. P-5136	REV. NO. 03	निर्माणकर्ता WORKED BY M.SINGH	जांचकर्ता CHECKED BY SDR.	31/7/07	31/7/07	





STEAM TURBINE ENGINEERING  
PRODUCT STANDARD

पृष्ठ का

Page 06 of 07

12.0 Hydraulic impulse connection details = R1/4

DATA SHEET TO BE FURNISHED BY THE BIDDER OF DUPLEX FILTER

- |      |  |                 |
|------|--|-----------------|
| 1.0  | a) Differential pressure switch cum indicator  | Yes/ No         |
|      | b) Connected piping & valve  | Yes/ No         |
| 2.0  | Priming valve & piping   | Yes/ No         |
| 3.0  | Legs, flange connections & other dimensions as per sketch                              | Yes/ No         |
| 4.0  | Contract drawings & curves   | Yes/ No         |
| 5.0  | Commissioning spares , O & M spares for five years of operation                        | Yes/ No         |
| 6.0  | Special erection/ Maintenance tools  | Yes/ No         |
| 7.0  | Quality of filtration  | Micron's        |
| 8.0  | Pressure loss at normal flow :   |                 |
|      | a) In cleaned condition  | mm wc           |
|      | i) In the filter   |                 |
|      | ii) In the valve   |                 |
|      | b) In saturated condition (50% choked condition)                                       | mm wc           |
| 9.0  | Material of components as per clause-5   | Yes/ No         |
| 10.0 | Weight of filter   | kg              |
| 11.0 | Tests to be carried out :  |                 |
|      | a) Chemical composition & Mechanical properties of components mentioned in clauses – 5 | Yes/ No         |
|      | b) NDT   | Yes/ No         |
|      | c) Hydraulic test of body (filter & valve)   | Yes/ No         |
|      | d) Functional test   | Yes/ No         |
|      | e) Collapsibility test   | Yes/ No         |
|      | f) Mesh size verification from recognized lab  | Yes/ No         |
|      | g) Pressure drop test  | Yes/ No         |
| 12.0 | Gross filtering area   | mm <sup>2</sup> |
| 13.0 | Net filtering area   | mm <sup>2</sup> |

LIST OF CROSS REFERRED STANDARD ——— NEXT PAGE.

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स्वत्वाधिकार एवं गोपनीय

सहस्र संख्या

INVENTORY NO

REV. NO.

03

निर्माणकर्ता  
WORKED BY

M.SINGH

जांचकर्ता  
CHECKED BY


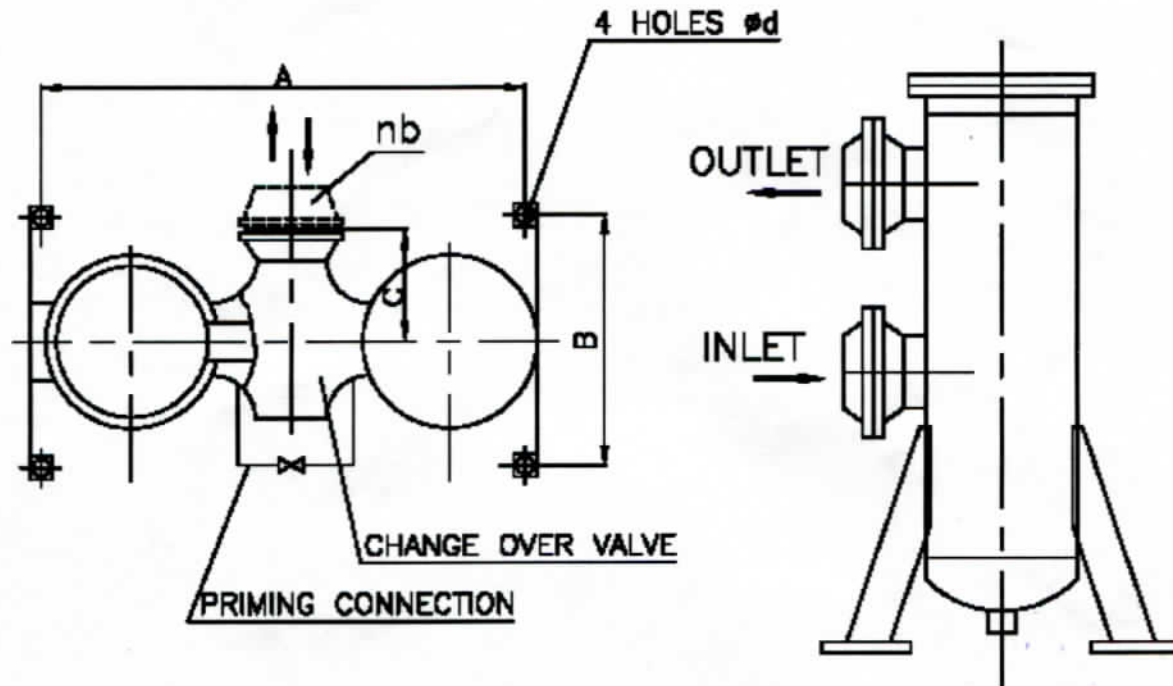

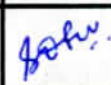
SDR

31/7/07

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31/7/07

दिनांक एवं हस्ताक्षर SIGN & DATE		<b>उत्पाद मानक</b>  <b>STEAM TURBINE ENGINEERING</b> <b>PRODUCT STANDARD</b>	<b>ST46056</b>  पृष्ठ का Page 07 of 07																																												
सुपरसेडिंग INVENTORY NO.	Cross referred standard:- IS:1012-1978 ISOV 46 ! ISO 2941, ISO 3968 AISI-321/316																																														
सारणी सूची संख्या को अधिकृतित करता है																																															
<b>COPYRIGHT AND CONFIDENTIAL</b>  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	DIMENSIONS ARE INDICATIVE ONLY NOT BINDING																																														
<b>स्वत्वाधिकार एवं गोपनीय</b>  इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ति है इसका प्रयोग एवं अप्रकाश रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए ।	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td>08</td> <td>150</td> <td>1120</td> <td>560</td> <td>255</td> <td>23</td> <td rowspan="6">DIN 2633</td> </tr> <tr> <td>06</td> <td>200</td> <td>1180</td> <td>560</td> <td>285</td> <td>23</td> </tr> <tr> <td>05</td> <td>125</td> <td>890</td> <td>560</td> <td>235</td> <td>23</td> </tr> <tr> <td>03</td> <td>200</td> <td>1315</td> <td>560</td> <td>285</td> <td>23</td> </tr> <tr> <td>02</td> <td>125</td> <td>890</td> <td>560</td> <td>235</td> <td>23</td> </tr> <tr> <td>01</td> <td>100</td> <td>785</td> <td>320</td> <td>235</td> <td>18</td> </tr> <tr> <td>VAR. NO.</td> <td>nb</td> <td>A</td> <td>B</td> <td>C</td> <td>d</td> <td>FLANGE DETAILS</td> </tr> </table>			08	150	1120	560	255	23	DIN 2633	06	200	1180	560	285	23	05	125	890	560	235	23	03	200	1315	560	285	23	02	125	890	560	235	23	01	100	785	320	235	18	VAR. NO.	nb	A	B	C	d	FLANGE DETAILS
08	150	1120	560	255	23	DIN 2633																																									
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दिनांक SIGN & DATE 13/8/17	<b><u>DUPLEX FILTER</u></b>																																														
सारणी सूची संख्या INVENTORY NO. P-5136	REV. NO.  03	निर्माणकर्ता WORKED BY M.SINGH	जांचकर्ता CHECKED BY SDR.																																												
																																															
		31/7/17	31/7/17																																												





## BOLL Differential Pressure Indicator TYPE 4.36.1, TYPE 4.36.2 TYPE 4.46.1, TYPE 4.46.2

### APPLICATION

The BOLL Differential Pressure Indicator is a robust and compact device indicating the contamination level of the filter elements.

The differential pressure between filter inlet and filter outlet is the measurable indicator for the contamination degree of the filter element. When the preset maximum value of differential pressure is reached, the filter needs to be cleaned.

The color of the disc segments visible in the two displays indicates the contamination degree: The red segment rises proportionally to the level of contamination. When the segment is completely red, the differential pressure limit is reached.

### DESIGN AND OPERATION

Inside the device is a plunger which is held in zero position by a spring. As differential pressure rises with increasing contamination, the plunger is displaced against the resistance of the spring. By magnetic transmission the display disc turns according to the movement of the plunger and shows more and more red segments. The setting of the requested differential pressure is effected by factory installation of a corresponding spring.

Differential Pressure Indicators with integral electronic contacts are provided with two switches which can be independently used either as switching contact or alarm contact. At 75% and at 100% of the preset differential

pressure threshold value, the contacts of the two reed-switches are activated magnetically.

The housing of the Differential Pressure Indicator is made of coated die-

cast aluminium and for use at an operating pressure of up to 100 bar. In case of type 4.46 the internal parts are made of stainless steel and for use at an operating pressure of up to 160 bar.

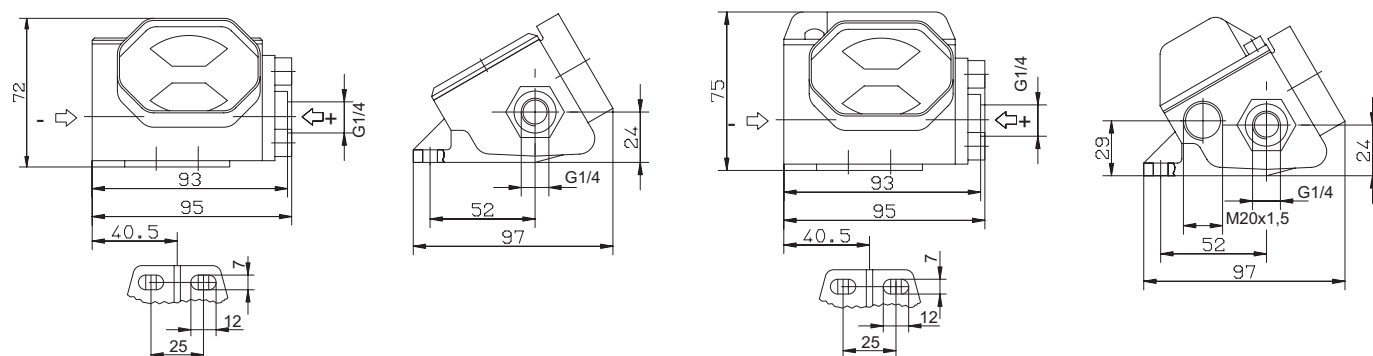


## Types of differential pressure indicators

Execution  Application / Medium	without contacts	with contacts			
	Type	Type	Type of contact		Type of connector for electrical wiring
			Make contact	Make break contact	
Oil, Liquid fuels, Cooling Lubricants	4.36.1	4.36.2 4.36.2.2 4.36.2.3	1x  2x 3x	1x 2x 3x	1 x M20 x 1.5 Harting plug type R 15 M M20 x 1.5 Harting plug type Han 7D M20 x 1.5
Water and chemicals compatible with austenitic steels and Viton	4.46.1	4.46.2 4.46.2.2 4.46.2.3	1x  2x 3x	1x 2x 3x	1 x M20 x 1.5 Harting plug type R 15 M M20 x 1.5 Harting plug type Han 7D M20 x 1.5

## Technical data

Type	4.36.1	4.36.2	4.46.1	4.46.2
Circuit diagram				
Protection class		IP 65		IP 65
Electrical data				
Switching voltage V max.		250	220	250
Frequency Hz max.		0-60	0-60	0-60
Switching current A max.		1,0	0,8	1,0
Switching capacity W/VA max.		60/60	40/60	60/60
Material	Die-cast Al.	Die-cast Al.	Die-cast Al.	Housing die-cast Al., inter-nals in contact with medium all austenitic steel
Operating data				
Operating pressure bar max.	100	100	160	160
Medium temperature °C max.	150	150	150	150
Ambient temperature °C max.	80	80	80	80
Differential pressure range $\Delta p$	0,5; 0,8; 1,2; 2,0; 3,0 bar (to be stipulated by purchaser)			



Type approval by: DNV, BV, RINA, LRS, GL