

ADDITIONAL TERMS AND CONDITIONS FOR GAS ANALYSER CABINET FOR 2X660 MW TALCHER PROJECT, (ANNEXURE I)

Enquiry no: B/4180/23/3104/V1

SL. NO.	TERMS	DESCRIPTION	YOUR CONFIRMATION & ACCEPTANCE																
1.	Compliance of GTC on GeM	In addition to the terms & conditions mentioned in below table, General terms and conditions on GeM 4.0 (Version 1.13) shall be applicable against this enquiry. Kindly confirm same is acceptable to you.																	
2.	Basis of quotation:	<p>Prices are to be quoted on Ex-works freight prepaid up to destination basis (Talcher project site). Kindly confirm that price has been quoted on Ex-works freight prepaid up to Project site basis inclusive of GST (i.e. including all taxes, duties, local levies/ transportation / loading & unloading charges, packing & forwarding charges etc.)</p> <p>The goods can be dispatched through any Bank approved transporters having their branch at Haridwar. The names and addresses of transporters approved by IBA as well as BHEL are posted at our website www.hwr.bhel.com.</p> <p>All items for a project will be purchased from single vendor. Evaluation will be done on project wise total landed cost to BHEL upto project site taking material supply and commissioning charges together.</p> <p>Transit insurance will be provided by BHEL.</p>																	
3.	Scope of enquiry with expected deliveries	<table border="1"> <thead> <tr> <th>Sl. No.</th> <th>Material Code and Item Description</th> <th>Qty.</th> <th>Delivery Requirement</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Gas Analyser Cabinet (W90418108072)</td> <td>4 sets</td> <td>Lot-1: 27.07.2025 (02 Sets) Lot-2: 26.11.2025 (02 Sets) (Main item)</td> </tr> <tr> <td>2</td> <td>Filter for Gas Analyser Cabinet (W90418108080)</td> <td>2 sets</td> <td>27.11.2025 (2 sets) (Spare item)</td> </tr> <tr> <td>3</td> <td>Commissioning of H2 Gas Analyser Cabinet (W90418108030)</td> <td>4 no.</td> <td>Lot-1: 27.07.2025 (02 Nos.) Lot-2: 26.11.2025 (02 Nos.)</td> </tr> </tbody> </table>	Sl. No.	Material Code and Item Description	Qty.	Delivery Requirement	1.	Gas Analyser Cabinet (W90418108072)	4 sets	Lot-1: 27.07.2025 (02 Sets) Lot-2: 26.11.2025 (02 Sets) (Main item)	2	Filter for Gas Analyser Cabinet (W90418108080)	2 sets	27.11.2025 (2 sets) (Spare item)	3	Commissioning of H2 Gas Analyser Cabinet (W90418108030)	4 no.	Lot-1: 27.07.2025 (02 Nos.) Lot-2: 26.11.2025 (02 Nos.)	
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3	Commissioning of H2 Gas Analyser Cabinet (W90418108030)	4 no.	Lot-1: 27.07.2025 (02 Nos.) Lot-2: 26.11.2025 (02 Nos.)																
4.	Pre-Qualification Requirements	All bidders should ensure submission of complete details and documents as called for in the pre-qualification 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.	Technical specification	Refer BHEL Document No. TG60530, Rev. 11 for details of scope, test reports & guarantee requirements.																	

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6.	Payment Term	<p>The payment shall be done within “n” no. of days of issue of consignee receipt-cum acceptance certificate (CRAC) and online submission of bills through GeM portal as per the below details:</p> <table border="1" data-bbox="432 383 1214 595"> <thead> <tr> <th data-bbox="432 383 847 456">Type of Bidder</th> <th data-bbox="847 383 1214 456">Payment Terms (Number of Days)</th> </tr> </thead> <tbody> <tr> <td data-bbox="432 456 847 501">Micro & Small Enterprises (MSEs)</td> <td data-bbox="847 456 1214 501">45 days</td> </tr> <tr> <td data-bbox="432 501 847 546">Medium Enterprises</td> <td data-bbox="847 501 1214 546">60 days</td> </tr> <tr> <td data-bbox="432 546 847 595">Non MSME</td> <td data-bbox="847 546 1214 595">90 days</td> </tr> </tbody> </table> <p>Payment for commissioning: 100% payment shall be done after successful commissioning report from project site. Kindly confirm</p>	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										
7.	PBG	<p>Performance Bank Guarantee shall be applicable @ 10% of the Total Order Value. PBG would be submitted along with dispatch documents on BHEL PBG format and from one of the BHEL consortium banks available at https://hwr.bhel.com. Kindly confirm.</p> <p>PBG to be valid till entire Guarantee/Warranty period. PBG acceptance/receipt certificate will form part of negotiable documents.</p>									
8.	Delivery Schedule/ Period	<p>Bidder to quote their delivery in no. of weeks from the date of PO placement or drawings/documents approval from BHEL considering the due dates in Enquiry.</p> <p>Final delivery would be either delivery period quoted by bidder in offer or delivery schedule as mentioned in enquiry or actual site requirement, whichever is later. Kindly confirm.</p> <p>Kindly confirm that commissioning is to be done by vendor on BHEL intimation. Vendor will depute their service engineer within 15 days of intimation from BHEL.</p>									
9.	Liquidated Damages	<p>Liquidated Damages shall be lotwise as per clause no. 15 (iii) of General terms and conditions on GeM 4.0 (Version 1.13).</p> <p>Date of LR/GR to be treated as date of delivery for LD purpose.</p>									
10.	Quality Requirements	<p>Please confirm for inspection by BHEL nominated inspection agency & NTPC as per NTPC approved QAP. Vendors to submit QAP for BHEL & NTPC approval.</p>									
11.	Engineering drawing and document approval	<p>Drawings/ Datasheets/ Documents as called for in the specifications shall be submitted for approval to BHEL for BHEL/ Customer approval within 30 days of purchase order. Any delay in delivery on account of late submission of drawings/documents shall be to vendors account. BHEL will arrange the approval of the drawings.</p>									
12.	Despatch documents	<p>Following documents to be enclosed with dispatch documents of this item:</p> <ol style="list-style-type: none"> Operation and Maintenance Manual for site. Test certificates and guarantee certificates. Erection & Maintenance manual Required. Pre-commissioning checklist. 									

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		<p>e) Other documents as mentioned in document no. TG60530, Rev. 11.</p> <p>Submission to BHEL-HEEP Haridwar of invoices for payment for material shall be done along with following originals:</p> <p>a) Tax Invoice b) Consignee copy of GR c) Packing list d) Test Certificates/Inspection Reports (TC/IR) e) Guarantee Certificate f) Original GST compliance certificate. g) MDCC issued by BHEL h) 10% PBG acceptance/receipt certificate by BHEL.</p> <p>Kindly submit original GR to BHEL HEEP Haridwar for end customer billing.</p>	
13.	MDCC Clause	<p>Material shall be dispatched only after issue of Material dispatch clearance certificate (MDCC) by BHEL. For issue of MDCC, you are required to submit all test certificates (TC) and inspection reports of third party (IR) immediately after inspection at least 7 days prior to the PO delivery schedule. BHEL will issue MDCC after receipt of TCs & IR, if complete & clear w.r.t. approved quality plan and comply with approved technical documents.</p> <p>The material should be dispatched within 07 days of issue of Material Dispatch Clearance Certificate (MDCC) by BHEL and other necessary documents (Road permit etc.).</p> <p>Any delay on submission/ approval shall be on respective account.</p>	
14.	Guarantee	<p>Three copies of test certificates for routine & type tests and guarantee certificates in English shall be furnished while executing the order. Guarantee Certificate shall be provided as per specification i.e. 24 months from the date of commissioning or 30 months from the date of supply, whichever is earlier. Please confirm.</p> <p>Any defect during guarantee period shall be rectified by supplier at no obligation.</p> <p>Normally deviation would not be accepted under this clause and your offer may be rejected.</p>	
15.	Customer Approval	<p>This is a customer control item.</p> <p>For customer un-approved vendors only: For arranging your approval from customer/NTPC, please submit credentials for Customer/NTPC review and approval. Please submit credential documents as per NTPC questionnaire in the tender enquiry.</p> <p>Your offer will be considered subject to customer approval before price bid opening. Please confirm.</p>	
16.	Packing	<p>For Indigenous Items:</p>	

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		<p>Before shipment of material, vendor has to obtain QR code from BHEL and these QR codes (properly laminated) shall be affixed on packages/boxes/crates/bundles of material to be supplied.</p> <p>While packing the material following is to be ensured:</p> <p>a. Material of unit-1, unit-2 and mandatory spares need to be packed in separate boxes.</p> <p>b. Loose items (if any) needs to be packed in boxes/crates or bundled together.</p> <p>c. For loose items one marker board needs to be send for each bundle for fixing RFID Tag at site.</p> <p>d. QR code will be issued box wise/bundle wise, vendor to ensure correct QR Code are affixed on the boxes/bundles.</p> <p>For Imported items: QR code will be affixed at site.</p>	
17.	Risk Purchase	<p>In case of abnormal delays (beyond the maximum late delivery period as per LD clause) in supplies / defective supplies or non-fulfilment of any other terms and conditions given in Purchase Order, BHEL may cancel the Purchase Order in full or part thereof, and may also make the purchase of such material from elsewhere / alternative source at the risk and cost of the supplier. BHEL will take all reasonable steps to get the material from alternate source at optimum cost. If bidder does not agree to the above Risk Purchase Clause, BHEL reserves the right to reject the offer. In case for compelling reasons BHEL accepts the offer without acceptance of this clause by the bidder and in the eventuality of Risk Purchase, appropriate action will be taken as per BHEL extant rules. This will be without prejudice to any other right of BHEL under the contract or under General Law.</p>	
18.	Regarding ITC based evaluation bid	<p>Kindly note that this tender is ITC (Input tax credit) enabled.</p> <p>Bidders shall have to enter their Prices inclusive of all taxes including GST during participation in bid on GeM portal.</p> <p>Kindly comply.</p>	
19.	Action against Bidder/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>	
20.	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>	

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	<p>a) they have controlling partner (s) in common; or</p> <p>b) they receive or have received any direct or indirect subsidy/ financial stake from any of them; or</p> <p>c) they have the same legal representative/agent for purposes of this bid; or</p> <p>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</p> <p>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</p> <p>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:</p> <ol style="list-style-type: none">1. The principal manufacturer directly or through one Indian agent on his behalf; and2. Indian/foreign agent on behalf of only one principal, or <p>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</p> <p>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."</p>	
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SPECIAL NOTE FOR BIDDERS:

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 uploaded along with offer on e-procurement portal.

1. Please submit replica of Price schedule (without prices) showing "quoted" in place of price along with techno-commercial bid (Part-I)
2. Please submit signed & Stamped copy (each page) of duly filled of confirmation column of "Additional Terms & Conditions (Annexure-I)" and its clause wise supporting documents where required.
3. The other terms & conditions shall be as per General terms and conditions on GeM 4.0 (Version 1.13).

Pre-Qualification Requirements (PQR) for Gas Analyzer Cabinet
Material code no. W90418108072, W90418108056 & W90418108030

Purpose of System: The purpose of said system is to continuously measure purity of H₂ in air, H₂ in CO₂ and CO₂ in air for Turbogenerator of power plant for monitoring. Gas analyser cabinet shall comprise sampling cell, valve, piping, indicator etc.

- 1) Bidder shall be manufacturer or authorized supplier of Gas analyzer cabinet. Letter of authorization or suitable documents shall be submitted for the same.
- 2) The Vendor should have supplied above system for at least two H₂ cooled Turbo-Generators and system must be working for one years to the satisfaction of end customer.

In support of above, Vendor to provide Customer satisfaction letter from minimum one customer or "Installation and commissioning" report (endorsed by end customer) from at least two installations. The report shall not be older than last 7 years from date of enquiry.

OR

Successful execution of at least one order for BHEL Haridwar for Gas analyser cabinet. *within last 7 years for Doc.*

- 3) Gas analyzer should be intrinsically safe, suitable for work under potentially explosive environment of hydrogen gas application.
- 4) The measurement may be based on gas density/ thermal conductivity principle.
- 5) Gas analyzer must have local display for operating ranges (0-100 Vol% CO₂ in air, 0-100 Vol% H₂ in CO₂ and 85/90-100 Vol% H₂ in air) and output in form of 4-20 mA for selected range shall be provided.
- 6) Analyzer should essentially meet following requirements: -
 - a) Response time T₉₀ within 5 Sec.
 - b) Flow effect <0.5% of span for variation in flow by ±10 L/Hr.

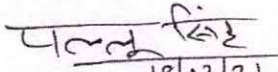
Notes: -

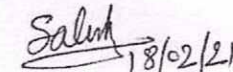
- 1) Vendor to furnish their complete reference / experience list for our review.
- 2) BHEL reserves the right to verify information submitted by vendor. In case the information is found false/ incorrect, the offer shall be rejected.

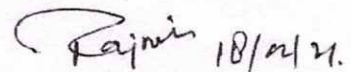
Prepared by

Checked by

Approved by


Pallu Singh 18/02/21
Mgr /CIE


Satish Kumar 18/02/21
DGM / CIE


Rajnish Gupta 18/02/21
AGM / 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											
	REV			Page 1 of 1										
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	M	B	N	10	11

		LEGEND: ! RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. 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	FOR CUSTOMER USE	
MANUFACTURER/SUBCONTRACTOR				APPROVED BY



CORPORATE QUALITY ASSURANCE
SUB-VENDOR QUESTIONNAIRE


i.	Item/Scope of Sub-contracting	
ii.	Address of the registered office	Details of Contact Person (Name, Designation, Mobile, Email)
iii.	Name and Address of the proposed Sub-vendor's works where item is being manufactured	Details of Contact Person: (Name, Designation, Mobile, Email)
iv.	Annual Production Capacity for proposed item/scope of sub-contracting	
v.	Annual production for last 3 years for proposed item/scope of sub-contracting	
vi.	Details of proposed works	
1.	Year of establishment of present works	
2.	Year of commencement of manufacturing at above works	
3.	Details of change in Works address in past (if any)	
4.	Total Area	
	Covered Area	
5.	Factory Registration Certificate	Details attached at Annexure – F2.1
6.	Design/ Research & development set-up (No. of manpower, their qualification, machines & tools employed etc.)	Applicable / Not applicable if manufacturing is as per Main Contractor/purchaser design Details attached at Annexure – F2.2 (if applicable)
7.	Overall organization Chart with Manpower Details (Design/Manufacturing/Quality etc)	Details attached at Annexure – F2.3
8.	After sales service set up in India, in case of foreign sub-vendor (Location, Contact Person, Contact details etc.)	Applicable / Not applicable Details attached at Annexure – F2.4
9.	Manufacturing process execution plan with flow chart indicating various stages of manufacturing from raw material to finished product including outsourced process, if any	Details attached at Annexure – F2.5



CORPORATE QUALITY ASSURANCE
SUB-VENDOR QUESTIONNAIRE

10.	Quality Control exercised during receipt of raw material/BOI, in-process , Final Testing, packing			Details attached at Annexure – F2.6		
11.	Manufacturing facilities (List of machines, special process facilities, material handling etc.)			Details attached at Annexure – F2.7		
12.	Testing facilities (List of testing equipment)			Details attached at Annexure – F2.8		
13.	If manufacturing process involves fabrication then-			Applicable / Not applicable		
	List of qualified Welders			Details attached at Annexure – F2.9		
	List of qualified NDT personnel with area of specialization			(if applicable)		
14.	List of out-sourced manufacturing processes with Sub-Vendors' names & addresses			Applicable / Not applicable Details attached at Annexure. –F2.10 (if applicable)		
15.	Supply reference list including recent supplies			Details attached at Annexure – F2.11 (as per format given below)		
<i>Project/ package</i>	<i>Customer Name</i>	<i>Supplied Item (Type/Rating/Model /Capacity/Size etc)</i>	<i>PO ref no/date</i>	<i>Supplied Quantity</i>	<i>Date of Supply</i>	
16.	Product satisfactory performance feedback letter/certificates/End User Feedback			Attached at annexure - F2.12		
17.	Summary of Type Test Report (Type Test Details, Report No, Agency, Date of testing) for the proposed product (similar or higher rating) Note:- Reports need not to be submitted			Applicable / Not applicable Details attached at Annexure – F2.13 (if applicable)		
18.	Statutory / mandatory certification for the proposed product			Applicable / Not applicable Details attached at Annexure – F2.14 (if applicable)		
19.	Copy of ISO 9001 certificate (if available)			Attached at Annexure – F2.15		
20.	Product technical catalogues for proposed item (if available)			Details attached at Annexure – F2.16		
Name: _____						
Desig: _____		Sign: _____		Date: _____		

Company's Seal/Stamp:-

दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद मानक (हीप : हरिद्वार) PRODUCT STANDARD (HEEP: HARIDWAR)	TG60530
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समूची
सूची
संख्या की

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The information on this

स्वाधिकार एवं गोपनीय
एक संकेत में ही यह सूचना प्रसार होनी
एकीकृत/संश्लेषित की जा सकती है अन्यथा
अनुमति के बिना प्रसारित नहीं किया जा सकता

दिनांक एवं हस्ताक्षर
SIGN & DATE

[Signature] 23/5/17

समूची सूची संख्या
INVENTORY NO.

P-6163

GENERATOR GAS ANALYSER CABINET (MICROPROCESSOR BASED)

1.0 INTRODUCTION:-

This standard specifies the requirement of non-purge type, intrinsically safe, non-sparking, microprocessor based H2 gas analyzer housed in properly ventilated cabinet. Alternatively, explosion proof, intrinsically safe gas analyzer housed in properly ventilated cabinet may be offered.

2.0 COMPLIANCE WITH STANDARD:-

There is no national/international standard available on the above subject. However this standard is based on BHEL's experience.

3.0 TECHNICAL DETAILS OF FABRICATED CABINET:-

The cabinet shall preferably be of Rittal / Pyrotech make conforming to international/national standards and will be meeting general aesthetics and other technical requirements. The cabinet structure shall be close type with serviceable double door on front side. The rear side of the cabinet may be provided with door or cover. The cabinet will be with doors/covers of material CRCA galvanized steel sheet. The cabinet dimensions shall be 1000(W) x 800(D) with standard height (including base frame height) of 2200(H) or as specified in enquiry. The sheet thickness shall not be less than 2.0 mm or as specified in enquiry/order. The paint shades will be as specified in the enquiry /order. The paint thickness shall not be less than 80 micron or as specified in enquiry/order. The degree of protection of the cabinet will be IP-54(As per IS 13947 (part-1) (assuming blanking of canopy for this purpose).

The sheet steel (enclosure) shall be pre-treated through chemical cleaning (7 tank) process of rinsing, de-greasing, rinsing, de-rusting, rinsing, phosphating and rinsing. After surface preparation, one coat of Zinc phosphate primer conforming to IS2074, shall be applied. After the first coat is dried up completely, second coat of red oxide primer shall be applied. The dry film thickness of each coat shall be minimum 30 microns. Synthetic enamel paint conforming to IS2932 shall be used for finish coats. Minimum 2 coats of synthetic enamel with proper drying intervals shall be applied. The minimum paint thickness shall be 80 microns.

			नाम NAME	दिनांक एवं हस्ताक्षर SIGNATURE & DATE
TSX	LALIT KUMAR	<i>Lalit Kumar</i>	अनुवादक TRANSLATED BY	
QAX	S. CHANDRA	<i>S. Chandra</i>	निर्माणकर्ता WORKED BY	BRIJ LAL RAM <i>Brij Lal Ram 23/05/17</i>
सहायक विभाग AGREED DEPTT.	नाम NAME	दिनांक एवं हस्ताक्षर DATE & SIGNATURE	जांचकर्ता CHECKED BY	SATISH KUMAR <i>Satish 23/05/17</i>
			पर्यवेक्षणकर्ता SUPERVISED BY	RAJNISH GUPTA <i>Rajnish 23/5/17</i>
SUPERSEDES			स्वीकृति APPROVED :	Gr. NO. 3.50
REV.NO.	11		निर्माण PREPARED :	ISSUED : TSX HEEP (HARDWAR)
Dt.	23.05.17		CIE	दिनांक DATE : 29.07.1998
CHANGE ADVICE NO.	TGE(CIE)-17-22	23.05.17		

BHEL भारतीय इंधन भारतीय इंधन	उत्पाद मानक (हीप : हरिद्वार) PRODUCT STANDARD (HEEP: HARIDWAR)		TG60530	
			पृष्ठ 9 का 2 Page 2 Of 9	
सिग्नेचर SIGN & DATE	SUPERSE DES	4.0 TECHNICAL PARAMETERS OF GAS ANALYSER EQUIPMENT		
मशीन मशीन	<p>4.1 The gas analyser shall be of micro-processor based design.</p> <p>4.2 The measurement may be based on thermal conductivity / gas density principles with typical schematics as per Figure-1. Unless specified otherwise in enquiry/order.</p> <p>4.3 The three range gas analyser shall have local display of following measuring ranges:-</p> <p>I. 0-100 vol% CO₂ in air</p> <p>II. 0-100 vol% H₂ in N₂</p> <p>III. 90-100 % H₂ in air</p> <p>4.4 One 4-20mA output and three potential free contacts to identify the each of active range will be provided to ensure correlation of the range with output.</p> <p>4.5 Explosion proof JB will be provided in the cabinet for external connections terminations (refer Ex-Proof JB drg of the specification).</p>			
कॉपीराइट एंड कॉन्फिडेंशियल The information on this document is the property of	5.0 MOUNTING ACCESSORIES:-			
स्वत्वाधिकार एवं गोपनीय या दस्तावेज में दी गई सूचना भारत में कॉपीराइट के अधीन है। इसका प्रसारण और प्रयोग के बिना की जाये	<p>5.1 Pr. regulator & relief valve (Material SS) (PR+RV)</p> <p>5.2 Filters (FLT)</p> <p>5.3 Tube Fitting (Material SS)</p> <p>5.4 Needle valves / NRVs / Multi way valves (Material SS) (NV/ NRV/BV2/BV5 etc)</p> <p>5.5 Flow / Rota meter (FM)</p> <p>5.6 Pressure Indicator / Gauge (PI1/PI2)</p> <p>5.7 Ring type sensor (Applicable for code no W90418108072 to generate low flow alarm)</p> <p>5.8 Bulk head connectors (Material SS)</p> <p>5.9 Explosion proof JB / electrical accessories required for the system.</p> <p>5.10 An oil trapper (OT) / separating vessel with transparent cover and drain valve may be provided in the cabinet. The inlet port of the vessel may be connected to sample inlet from the generator. The outlet port may be taken as sample gas to the analyser.</p> <p>5.11 Suitable flame arrestors (FA) may be provided at sampling inlet/outlet of the analyzer to avoid possibility of fire propagation.</p> <p>5.12 Above Items to be suitably mounted inside the GA cabinet and should be firmly secured to avoid any damage due to vibration / shock during transportation.</p> <p>5.13 Test gas cylinders of H₂ gas (90% H₂ in N₂) and (100% H₂) gas be provided for calibration checking at zero / span limits at site. Additionally, CO₂ cylinder with 100% Co₂ will be supplied. All these cylinders will be with tubing (for internal / external mounting) for site calibration.</p> <p>5.14 An acrylic/ stainless steel name plate with inscription "GENERATOR GAS ANALYSER CABINET" will be provided in front top of the cabinet.</p> <p>5.15 All above accessories shall be of makes as indicated in specification. The alternate makes will be subject to approval from BHEL. The vendor will furnish complete BOM along with offer for approval. The GA drawing /BOM will be approved by BHEL/Client.</p>			
सिग्नेचर SIGN & DATE	भारतीय इंधन INVENTORY P-6167	REV. NO. 11	निर्माणकर्ता WORKED BY BRIJ LAL RAM	23/05/17
			जांचकर्ता CHECKED BY SATISH KUMAR	23/05/17

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मार्गदर्शक
पृष्ठी

6.0 POWER SUPPLY
 The system shall be suitable for 240 VAC+/- 10%, 50 Hz +/- 5% or as specified in the enquiry/ order. Suitable power surge protection system to be provided to save analyzer from any variation in supply voltage.

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7.0 ACCURACY
 The parameters within the limits as specified below.

Zero Drift	≤ 1 % of smallest possible measuring range/week.
Sensitivity/span Drift	≤ 0.5 % of smallest possible measuring range.
Inherent linear drift	≤ 1% of span/week.
Repeatability / Accuracy	≥ 1% of span
Temperature effect	≤ 1% of span per 10 degree cel based on temp at the time of calibration
Flow effect	≤ 0.5% of span for variation in flow by +/- 10L/hr from rated flow
Response time	≤ T 90 < 5 Sec.
Detection limit	≤ 1% of span.

स्वाधिकार एवं गोपनीय
यह दस्तावेज में दी गई सूचना, भारत देश की
संविधानगत विधिओं की प्रकृति है, अतः
अन्यथा यह सूचना अन्य में किसी को प्रदा
न की जायेगी

8.0 OUTPUT
 The 4-20 mA output shall be suitable for load burden of at least up to 500 ohms. There shall not be any variation in output during burden change from short circuit to 500 ohms.

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9.0 INLET / OUTLET CONNECTIONS

9.1 The end connection shall be 1/8" BSP or 1/4" NPT (NPT is preferred to avoid any chances of leakage). Suitable adapters / unit nuts /bulk head connectors shall be provided for connection to minimum 6mm OD tubing. All connections shall be done with 6mm OD, 4mm ID stainless steel tubing. The outlet vents shall be joined inside the cabinet with NRV for protection of gas analyser from back pressure. Only single vent will terminate for venting purpose. The bulk head connection for vent pipe should be of size NB25 using suitable adopters and sample inlet/outlet shall be provided on right or left side of the cabinet. Inscription plates for designations will be provided on each item in the cabinet indicating application.

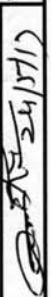
9.2 Depending upon site requirements the external cable may enter from bottom or top of the cabinet. Hence the cable entry will be customer / site selectable.



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10.0 AMBIENT TEMPERATURE
 The gas analyser equipment shall be suitable for ambient temperature 0-50 Degree Celsius and maximum relative humidity of 0-95%.

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शीट नंबर INVENTORY NO. A 61 63	REV. NO. 11	निर्माणकर्ता WORKED BY BRIJ LAL RAM	BRIJ LAL RAM	जांचकर्ता CHECKED BY SATISH KUMAR	SATISH KUMAR	पृष्ठ 9 Page 4	का 4 Of 9
SUPERSEDES INVENTORY 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.		उत्पाद मानक (हीप : हरिद्वार) PRODUCT STANDARD (HEEP: HARIDWAR)					
SIGN & DATE 		11.0 TESTING 11.1 Type Testing:- Type test certificates for suitability of the analyser for hazardous area application will be furnished with the offer. These certificates from international certifying authorities (CENLEC / FM / CSA / TUV) will be acceptable. However, these will not be older than 5 years. The analyser has to be suitable for H2 purity measurement in generators with H2 cooling (Zone 2, Group IIC, Ex ib or better application). 11.2.0 Routine testing : Each equipment shall be subjected to following tests at supplier's works:- 11.2.1 Layout / visual checking as per approved layout / schematic drawings. 11.2.2 Meggering of power parts / TB's shall be done with the help of 500V megger (electronic parts to be isolated/ shorted during this testing). IR value should be more than 20 M Ohms. 11.2.3 Gas tightness test for sample gas path to be done at air pressure of 5.0 Kg/cm2. No leakage should be observed 30 minutes. 11.2.4 Calibration test for analyser for different composition of gas mixtures in 'H2 in air' measuring range (minimum 5 points) will be carried out at vendor's Works. The results have to be within specified accuracy limits. 11.2.5 The calibration test certificates from the principle may be verified for calibration checking for the remaining two ranges. 11.2.6 Power supply variation test to check repeatability accuracy as per Clause 7.0 for H2 in air range. 12.0 ACCEPTANCE NORMS : 12.1 Compliance to clause 11.1 12.2 routine tests as per clause 11.2 13.0 DOCUMENTS: 13.1 Catalogues:-Two copies of descriptive catalogues in English language giving technical details like allowable maximum load burden, response time, power consumption, dimensional details and external terminal details for customer's interconnections etc shall be furnished along with the offer. 13.2 Drawings:- Two copies of the schematic diagram, complete BOM with make/type of accessories and wiring /layout diagram of the equipment giving terminal details and size of the terminals shall also be furnished along with the offer for approval. These shall also later form part of O&M manual.					

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SUPERSEDES INVENTORY	<p>13.3 O&M Manuals:- The complete O&M manuals in English version giving the details circuit diagrams, trouble shooting instructions, servicing instructions etc., shall be furnished along with main supply as per quantity mentioned in the enquiry/order. One CD-ROM for the O&M will be supplied to BHEL/Hardwar.</p> <p>14.0 PACKING: The analyser shall be fixed with the help of technological fixtures before dispatch and packed in thermo cole boxes placed in cartons or cases with adequate cushioning material to minimize movements of internals and to ensure that the equipment is capable of withstanding transit risk without damage. The package shall be adequate to withstand loading/unloading jerks and transit movements by rail/ road. The supplier may also supply the analyser / electronics as loose for assembly later at site.</p> <p>15.0 SPARE PARTS:- Recommended spare parts list for 3 years trouble free operation and mandatory spares / consumable will be submitted for BHEL's reference along with the offer. The offers for spares shall indicate breakup of prices for individual parts. BHEL reserves the right to order the spare parts either along with the main equipment or separately in which case the validity of the offer for spare parts shall be extended by 6 months from the date of placement of the order for main equipment.</p> <p>16.0 MARKINGS</p> <p>16.1 The manufacturer's identification number of the instrument in the English shall be marked in suitable location and the same shall be mentioned in the relevant test certificates.</p> <p>16.2 The BHEL material code number as given in the enquiry / order shall be embossed in each item. The following details shall be marked on each packing case.</p> <p>a) Manufacturer's name b) BHEL order no c) BHEL material code no d) BHEL monogram will be fixed on front top (right side). This will be supplied loose by BHEL along with PO or during inspection.</p>			
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स्वलाधिकार एवं गोपनीय इस दस्तावेज में दी गई सूचना भारत भारती भारतीभारत लिमिटेड की संपत्ति है। इसका प्रयोग एवं प्रसारण के बिना की जायेगी और इसका उपयोग किसी भी प्रकार से किया जाना नहीं है।				
REVISE FOR SIGN & DATE 				
श्री सूची संख्या INVENTORY NO. P-6163	REV. NO. 11	निर्माणकर्ता WORKED BY BRIJ LAL RAM <i>Brij Lal Ram</i>	जांचकर्ता CHECKED BY SATISH KUMAR <i>Satish</i>	23/05/17 23/05/17

BHEL भारतीय भारी मशीनकारियों की शक्ति का प्रतीक है। भारतीय भारी मशीनकारियों की शक्ति का प्रतीक है।	उत्पाद मानक (हीप : हरिद्वार) PRODUCT STANDARD (HEEP: HARIDWAR)		TG60530	
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SUPERSEDES INVENTORY	<p>17.0 QUALITY PLAN & INSPECTION Three copies of complete QA plan giving the details of tests to be carried out during the various stages of manufacture shall be furnished to BHEL for approval along with the offer in BHEL format. BHEL reserves its right to depute their / customer's representative during final testing at supplier's works. The supplier will arrange this inspection without any additional cost. The BOM will be as per BHEL approved schematics. The reference of the scheme may be given in QAP</p> <p>18.0 TEST AND GUARANTEE CERTIFICATES: Three copies of test certificates for routine & type tests and guarantee certificates in English shall be furnished while executing the order. The equipment will be warranted for 24 months trouble free operation from the date of commissioning or 30 months from date of supply, whichever is earlier (unless, otherwise specified in the enquiry / order).</p> <p>19.0 ERECTION AND COMMISSIONING a) Installation:- The supplier shall arrange satisfactory installation of supplied system and charge the cabinet suitably. With help of test/ sample cylinder, check function of H2 gas analyser system for all three ranges suitably. b) Commissioning:- 1) The supplier shall arrange satisfactory commissioning of analyser. 2) MOM to be signed with End customer and BHEL Site engineer. 3) System will be kept under observation for the warranty period. 4) Within this warranty period, if any part of system don't perform satisfactory, same to be repaired or replaced without any commercial implication to BHEL</p> <p>20.0 CROSS REFERRED STANDARDS I) IS5 II) IS9000. III) IS13947 (Part-I)</p>			
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स्थायिकार एवं गोपनीय इस दस्तावेज में की गई जानकारी भारत भारी मशीनकारियों की शक्ति का प्रतीक है। भारतीय भारी मशीनकारियों की शक्ति का प्रतीक है।				
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INVENTORY NO. P-6163	REV. NO. 11	निर्माणकर्ता WORKED BY BRIJ LAL RAM <i>Brij Lal Ram</i>	जांचकर्ता CHECKED BY SATISH KUMAR <i>Satish</i>	23/05/17 23/05/17

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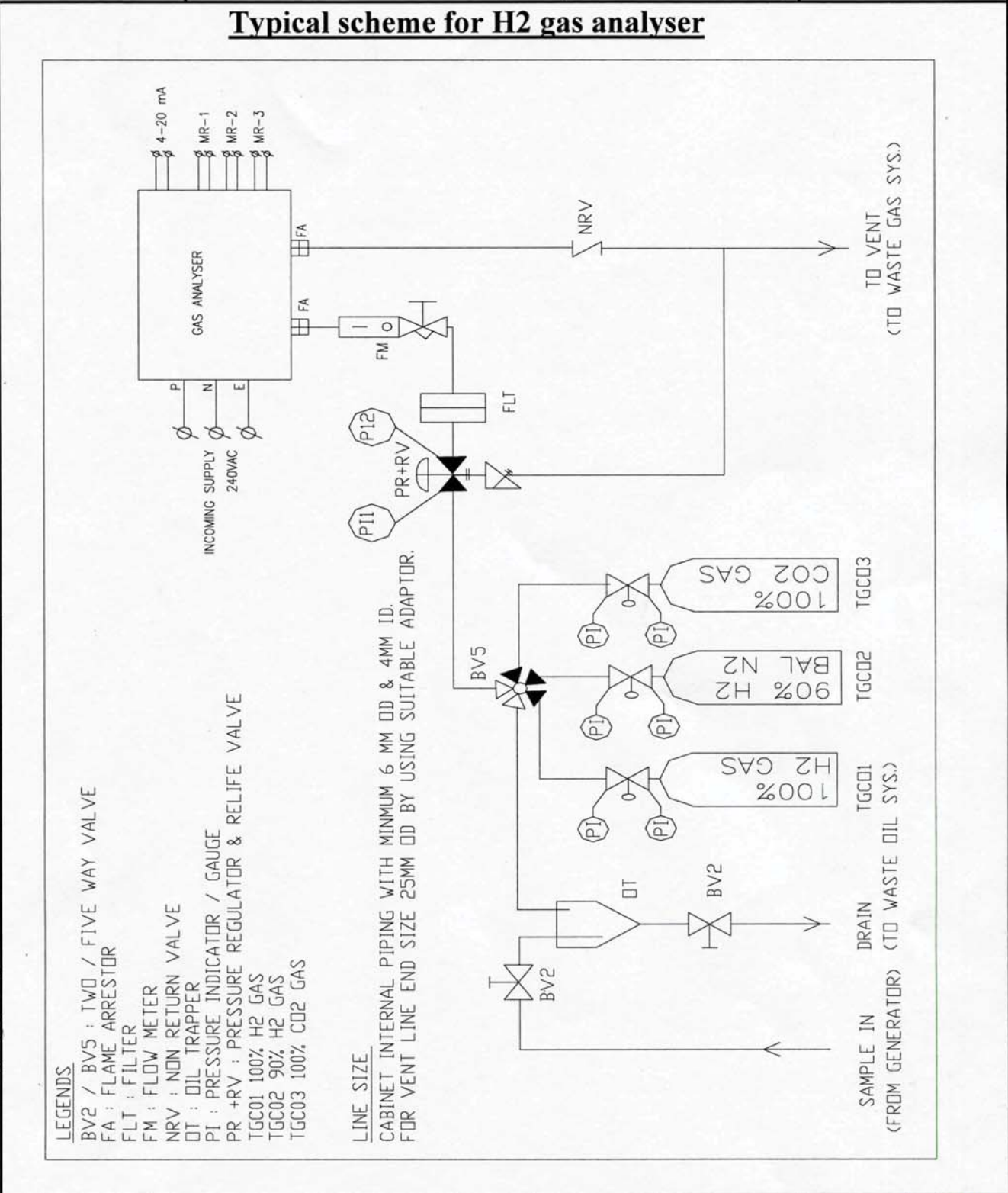
इस दस्तावेज में दी गई सूचना भारत भारी उपकरण लिमिटेड की संपत्ति है। इसका प्रयोग एवं प्रसारण अन्य से किसी भी प्रकार में बिना भारत भारी उपकरण लिमिटेड की अनुमति के बिना न किया जाए।

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		जांचकर्ता CHECKED BY	SATISH KUMAR	Brij Lal Ram	23/05/17
				Satish Kumar	23/05/17

SUPERSEDES INVENTORY	<h3 style="margin:0;">Make of Major items</h3>
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Sl no	Items	Recommended make of main items
1	PANNEL	Rittal, Pyrotech, ASPL
2	GAS CYLINDERS	Inox, Bhuruka, Chemtron, Six Sigma
3	PRESSURE REDUCING REGUALATOR	Span Gas, Baldota, Tescom
4	FILTER	Swagelok, Nupro Dynex, Shavo Norgren
5	FITTINGS AND TUBINGS	Excel Hydro, Swagelok
6	NON RETURN VALVE	Swagelok, Baldota, Excel hydro
7	2 / 5 WAY BALL VALVE	HAVI, Swagelok, Baldota, Excel Hydro, Whitey
8	OIL SEPARATOR	Norgren
9	FLOWMETER / ROTAMETER	Placka
10	FLAME ARRESTOR	WITT, GCE
11	ISOLATION SWITCH 16A / MCB	Rstahl, Siemens, Schneider
12	PRESSURE GAUGES (0-7/10 KG/Sq.CM)	Waaree, Span Gas
13	RING TYPE SENSOR	P&F (IF APPLICABLE)
14	Ex-proof JUNCTION BOX	P&F, Exprotecta, Shyam switchgear
16	Wires & Accessories	Reputed make

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 इस दस्तावेज में की गई सूचना भारत हीवी इलेक्ट्रिकल लिमिटेड की संपत्ति है। इसका प्रयोग एवं प्रसारण के बिना भारत हीवी इलेक्ट्रिकल लिमिटेड की अनुमति के बिना न किया जाना।

Before use please
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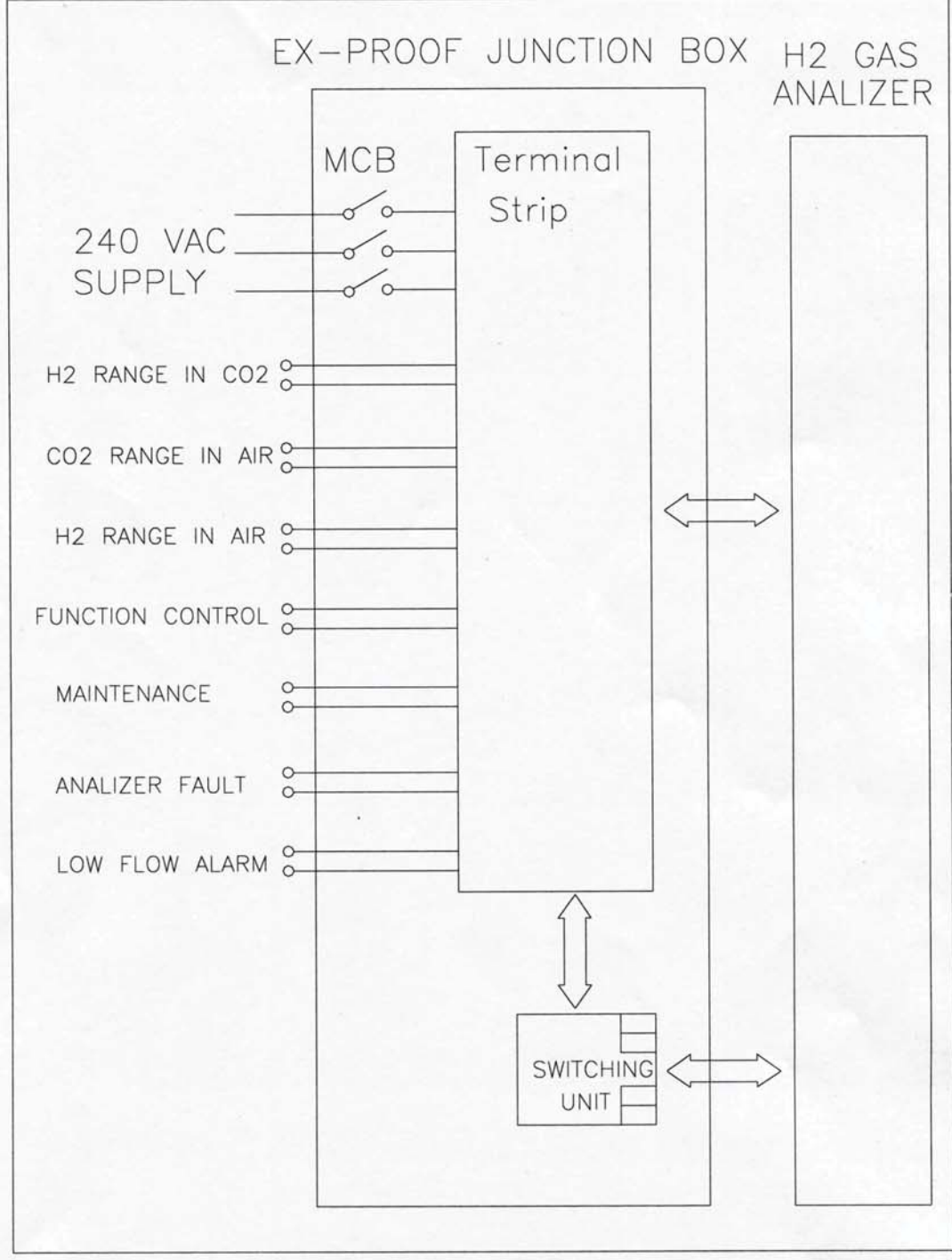
SUPERSEDES
INVENTORY

Typical EX-Proof JB drg.

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एवं संप्रेषण के बिना या इसके बिना, जो कि कंपनी के हित में हानिकारक हो न किता
आए।

निर्माता का नाम
SIGN & DATE



शी. सूची संख्या
INVENTORY NO. **P-6/63**

REV. NO. 11

निर्माणकर्ता
WORKED BY **BRIJ LAL RAM**

जांचकर्ता
CHECKED BY **SATISH KUMAR**

Brij Lal Ram 28/05/17

Satish 23/05/17