

**GOVERNMENT OF INDIA
DEPARTMENT OF SPACE
ISRO PROPULSION COMPLEX (IPRC)
MAHENDRAGIRI**

Tender for Non-lubricated Hydrogen gas compressors

Bids to be submitted online

Tender No.: IPRC/PURGP2/IP202300049801 dated 03-05-2023

A. Tender Details

Tender No :	IPRC/PURGP2/IP202300049801
Tender Date :	03-05-2023
Tender Classification:	GOODS
Purchase Entity :	PURGP2
Centre :	ISRO PROPULSION COMPLEX (IPRC)

Non-lubricated Hydrogen gas compressors

This is a two-part bid. Price details shall NOT be mentioned in technical Bid/attachments, failing which the offer will not be considered.

Foreign vendors are not permitted to quote.

Only Class-I and Class-II Local suppliers as per Make in India (MII) Policy are eligible to participate in the bid and submit the MII declaration certificate which is mandatory.

The percentage of local content is mandatory and it should be specifically mentioned in the offer.

Preference will be given to Class-I Local Supplier and in their absence, Class-II Local Supplier will be considered.

MSME preference is applicable only against the claim of the manufacturer and production of documentary evidence by the manufacturers for the registration of particular item under MSME.

Last minute clarification on tenders will not be entertained.

This is an e-Tender. Hence Postal/Fax/Email tenders will not be accepted.

Acceptance of Guarantee / Warranty, PBG, SD, LD & AMC shall be complied. (AMC charges will be considered/ loaded for cost comparative purpose for arriving the L1 price)

Please mention your Government E market Place (GeM) Seller ID for our reference.

A.1 Tender Schedule

Bid Submission Start Date :	03-05-2023 17:00
Bid Clarification Due Date :	16-05-2023 11:30
Bid Submission Due Date :	07-06-2023 14:00
Bid Opening Date :	07-06-2023 14:00

Price Bid Opening Date :

08-06-2023 10:30

B. Tender Attachments

NA

Instructions To Vendors

1. STANDARD TERMS AND CONDITIONS (DOS PM:19)

1.

a. Prices are required to be quoted according to the units indicated in the annexed tender form. When quotations are given in terms of units other than those specified in the tender form, relationship between the two systems of unit must be furnished.

2. Arbitration in the event of any dispute or difference arising under these terms & conditions or any condition contained in the Purchase Order or in connection with this Contract. (except as to any matter the decision of which is specially provided for by these conditions), the same shall be referred to the sole arbitration of the Head of the Purchase Office or of some other person appointed by him, and the dispute further processed in terms of the Arbitration & Conciliation Act, 1996. There will be no objection that the arbitrator is a Government Servant that he had to deal with matter which the Contract relates to or that in the course of his duties as Government Servant has expressed views on all or any of the matters in dispute or difference. The award of the arbitrator shall be final and binding on the parties of this Contract.

3. As per the Rule 144(xi) of General Financial Rule, 2017, any bidder from a country which shares a land border with India will be eligible to bid in any procurement whether of goods, services (including consultancy services and non-consultancy services) or works (including turnkey projects) only if the bidder is registered with the competent authority ie., Department for Promotion of Industry and Internal Trade (DPIIT).

Hence, Vendors or Agents of a Vendor (Indian or others) from a country sharing border with India shall submit copy of valid registration made with Department for Promotion of Industry and Internal Trade (DPIIT), Government of India along with the tender mandatorily, without which the offer will be treated as invalid.

4. b. Corrections, if any, in the quotation must be attested. All amounts shall be indicated both in words as well as in figures. When there is difference between the amount quoted in words and figures, the amount quoted in words shall prevail.

5. GST/ other duties/levies, where legally leviable and intended to be claimed, should be distinctly shown separately in the tender.

6. Guarantee: The stores offered should be guaranteed for a minimum period of twelve months against defective stores design, operation or manufacture. For defects noticed during the guarantee period, replacement/repair should be arranged free of cost within a reasonable period of such notification. In cases where our specifications call for a guarantee period more than 12 months specifically, then such a period shall apply

7. If the arbitrator is a person appointed by the Head of the Purchase Office, In the event of his denying or neglecting or refusing to act, or resigning or being unable to act, for any reason, shall be lawful for the Head of the Purchase Office either to proceed with the reference himself or to appoint another person as arbitrator in place of the outgoing arbitrator subject, as aforesaid, to the Arbitration and Conciliation Act, 1996, and the rules thereunder and any statutory modifications thereof for the time being in force shall be deemed to apply to the arbitration proceeding under the clause. The Arbitrator shall have the power to extend with the consent of the Purchaser and the Contractor the time for making and publishing the award. The venue of arbitration shall be the place as the Purchaser in his absolute discretion may determine. Work under the Contract shall, if reasonably possible, continue during Arbitration Proceedings.

8. If the arbitrator is the Head of the Purchase Office :

(i) In the event of his being transferred or vacating his office by resignation or otherwise, it shall be lawful for his successor in office either to proceed with the reference himself for to appoint another person as arbitrator, or In the event of his being unwilling or unable to act for any reason, it shall be lawful for the Head of the Purchase Office to appoint another person as arbitrator

9. Late Tenders will not be considered

10. Model Certificate for Tenders:

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that this bidder is not from such a country or, if from such a country, has been registered with the Competent Authority. I hereby certify that this bidder fulfils all requirements in this regard and is eligible to be considered

11. Packing and Forwarding: The Contractor will be held responsible for the stores being sufficiently and properly packed for transport by rail, road, sea or air, to withstand transit hazards and ensure safe arrival at the destination. The packing and marking of packages shall be done by and at the expense to the Contractor.

12. Payment terms are full payment within 30 days from the date of receipt and acceptance of material ordered. Our Bankers are State Bank of India, Mahendragiri.

13. Quotation should be valid for at least 120 days from the date of opening of the tender.

14. Specifications: Stores offered should strictly conform to Purchasers specifications. Deviations, if any, shall be clearly indicated by the tenderer in his quotation. The tenderer should also indicate the Make/Type number of the stores offered and provide catalogues, technical literature and samples, wherever necessary, along with the quotation. Test certificate, wherever necessary, should be forwarded along with supplies. Wherever options are called for in our specifications, the tenderer should address all such options, wherever specifically mentioned by us, and the tenderer could suggest changes to specifications with appropriate response for the same. Even in such case, the tenderer should state why he cannot meet our specifications and why he is suggesting the change.

15. Successful tenderer will have to furnish in the form of a Bank Guarantee or in any other form as called for by the Purchaser towards adequate security for the materials/property provided by the purchaser for the due execution for the Contract.

16. TERMS AND CONDITIONS OF TENDER:

Price quoted should be on the basis of FOR IPRC, Mahendragiri or delivery at site
The Purchaser will not pay separately for transit insurance, and the risk and cost during transit shall be exclusively the responsibility of the Contractor and the purchaser shall pay only for such stores as are actually received in good condition in accordance with the Contract.

17. The Contractor shall at all times indemnify the Purchaser against all claims which may be in respect of the stores for infringement of any right protected by Patent, Registration or design or Trade Mark and shall take all risks of accidents or damage which may cause a failure of the supply from whatever causes arising and the entire responsibility for the sufficiency of all means used by him for the fulfilment of the Contract

18. The Purchaser reserves the right to accept or reject any quotation fully or partly without assigning any reason therefore.

19. The time for and the date of delivery of the stores stipulated in the Purchase Order shall be deemed to be the essence of the Contract and delivery must be completed not later than the date specified therein, and failure to do so, without adequate justification, may involve cancellation of the Contract at the discretion of the Purchaser.

20. Vendors may please note that in case of two-part tender, the price details shall be mentioned only in the price-bid template. If the price details either in part or full are indicated in the technical bid, the bid will be disqualified.

21. Where counter terms and conditions/printed or cyclostyled conditions of sale have been offered by the tenders, the same shall not be deemed to have been accepted by the Purchaser unless the Purchaser's specific written acceptance thereof is obtained

2. STANDARD TERMS AND CONDITIONS (DOS PM: 20)

1. ACCEPTANCE OF STORES:

(a) The stores shall be tendered by the Contractor for inspection at such places as may be specified by the purchaser at the Contractor's own risk, expense and cost.

(b) It is expressly agreed that the acceptance of the stores Contracted for, is subject to final approval by the purchaser, whose decision shall be final.

(c) If, in the opinion of the purchaser, all or any of the stores do not meet the performance or quality requirements specified in the Purchase Order, they may be either rejected or accepted at a price to be fixed by the purchaser and his decision as to rejection and the prices to be fixed shall be final and binding on the Contractor.

(d) If the whole or any part of the stores supplied are rejected in accordance with Clause No. 8 (c) above, the purchaser shall be at liberty, with or without notice to the Contractor, to purchase in the open market at the expense of the Contractor stores meeting the necessary performance and quality Contracted for in place of those rejected, provided that either the purchase, or the agreement to purchase, from another supplier is made within six months from the date of rejection of the stores as aforesaid.

2. DELIVERY:

(a) The time for and the date of delivery of the stores stipulated in the Purchase Order shall be deemed to be the essence of the Contract and delivery must be completed on or before the specified dates.

(b) Should the Contractor fail to deliver the stores or any consignment thereof within the period prescribed for such delivery, the purchaser shall be entitled at his option either.

(i) to recover from the Contractor as agreed liquidated damages and not by way of penalty, a sum of 0.5% per week of the price of any stores which the Contractor has failed to deliver as aforesaid or during which the delivery of such store may be in arrears subject to a minimum of 10%, or

(ii) to purchase from elsewhere, without notice to the Contractor on the account and at the risk of the Contractor, the stores not delivered or others of a similar description (where others exactly complying with the particulars, are not, in the opinion of the purchaser, readily procurable, such opinion being final) without cancelling the Contract in respect of the consignment (s) not yet due for delivery, or

(iii) to cancel the Contract or a portion thereof and if so desired to purchase or authorise the purchase of stores not so delivered or others of a similar description (where others exactly complying with the particulars are not, in the opinion of the purchaser, readily procurable, such opinion final) at the risk and cost of the Contractor.

In the event of action being taken under sub-clause (ii) & (iii) of clause 10 (b) above, the Contractor shall be liable for any loss which the purchaser may sustain on that account, provided that the re-purchase or if there is an agreement to re-purchase then such agreement is made within six months from the date of such failure. But the Contractor shall not be entitled to any gain on such re-purchase made against default. The manner and method of such re-purchase shall be at the discretion of the purchaser, whose decision shall be final. It shall not be necessary for the purchaser to serve a notice of such re-purchase on the defaulting Contractor. This right shall be without prejudice to the right of the purchaser to recover damages for breach of Contract by the Contractor.

3. DISPATCH:

The Contractor is responsible for obtaining a clear receipt from the Transport Authorities specifying the goods dispatched. The consignment should be dispatched with clear Railway Receipt/Lorry Receipt. If sent in any other mode, it shall be at the risk of the Contractor. Purchaser will take no responsibility for short deliveries or wrong supply of goods when the same are booked on "said to contain" basis. Purchaser shall pay for only such stores as are actually received by them in accordance with the Contract.

4. ERECTION OF PLANT & MACHINERY:

Wherever erection of a plant or machinery is the responsibility of the Contractor as per the terms of the Contract and in case the Contractor fails to carry out the erection as and when called upon to do so within the period specified by the purchaser, the purchaser shall have the right to get the

erection done through any source of his choice. In such an event, the Contractor shall be liable to bear any additional expenditure that the purchaser is liable to incur towards erection. The Contractor shall, however, not be entitled to any gain due to such an action by the purchaser.

5. EXTENSION OF TIME:

As soon as it is apparent that the Contract dates cannot be adhered to, an application shall be sent by the Contractor to the purchaser. If failure, on the part of the Contractor, to deliver the stores in proper time shall have arisen from any cause which the purchaser may admit as reasonable ground for an extension of the time (and his decision shall be final) he may allow such additional time as he considers it to be justified by circumstances, of the case without prejudice to the purchaser's right to recover liquidated damages under clause 10 thereof.

6. GUARANTEE & REPLACEMENT:

- (a) The Contractor shall guarantee that the stores supplied shall comply fully with the specifications laid down, for material, workmanship and performance.
- (b) For a period of twelve months after the acceptance of the stores, if any defects are discovered therein or any defects therein found to have developed under proper use, arising from faulty stores design or workmanship, the Contractor shall remedy such defects at his own cost provided he is called upon to do so within a period of 14 months from the date of acceptance thereof by the purchaser who shall state in writing in what respect the stores or any part thereof are faulty.
- (c) If, in the opinion of the purchaser, it becomes necessary to replace or renew any defective stores such replacement or renewal shall be made by the Contractor free of all costs to the purchaser, provided the notice informing the Contractor of the defect is given by the purchaser in this regard within the said period of 14 months from the date of acceptance thereof.
- (d) Should the Contractor fail to rectify the defects, the purchaser shall have the right to reject or repair or replace at the cost of the Contractor the whole or any portion of the defective stores.
- (e) The decision of the purchaser notwithstanding any prior approval or acceptance or inspection thereof on behalf of the purchaser, as to whether or not the stores supplied by the Contractor are defective or any defect has developed within the said period of 12 months or as to whether the nature of the defects requires renewal or replacement, shall be final, conclusive and binding on the Contractor.
- (f) To fulfill guarantee conditions outlined in clause 4 (a) to (e) above, the Contractor shall, at the option of the purchaser, furnish a Bank Guarantee (as prescribed by the purchaser) from a Bank

approved by the purchaser for an amount equivalent to 10% of the value of the Contract along with first shipment documents. On the performance and completion of the Contract in all respects, the Bank Guarantee will be returned to the Contractor without any interest.

(g) All the replacement stores shall also be guaranteed for a period of 12 months from the date of arrival of the stores at purchaser site.

(h) Even while the 12 months guarantee applies to all stores, in case where a greater period is called for by our specifications then such a specification shall apply in such cases the period of 14 months referred to in para 4 (b) & (c) shall be the guarantee period plus two months.

7. PACKING FORWARDING & INSURANCE:

The Contractor will be held responsible for the stores being sufficiently and properly packed for transport by rail, road, sea or air to withstand transit hazards and ensure safe arrival at the destination. The packing and marking of packages shall be done by and at the expense of the Contractor. The purchaser will not pay separately for transit insurance, all risks in transit being exclusively of the Contractor and the Purchaser shall pay only for such stores as are actually received in good condition in accordance with the Contract.

8. PRICES:

Tender offering firm prices will be preferred. Where a price variation clause is insisted upon by a tenderer, quotation with a reasonable ceiling should be submitted. Such offers should invariably be supported by the base price taken into account at the time of tendering and also the formula for any such variation/s.

9. REJECTED STORES:

Rejected stores will remain at destination at the Contractor risk and responsibility. If instructions for their disposal are not received from the Contractor within a period of 14 days from the date of receipt of the advice of rejection, the purchaser or his representative has, at his discretion, the right to scrap or sell or consign the rejected stores to Contractor's address at the Contractor's entire risk and expense, freight being payable by the Contractor at actuals.

10. SECURITY DEPOSIT(SD):

The Supplier shall provide Bank Guarantee for an amount equivalent to the 3% (Three PERCENT) of the total Order value towards Security Deposit for the due performance of the Purchase Order. The Security Deposit can be submitted in the form of Bank Guarantee (format enclosed) or Fixed Deposit receipt obtained from any Nationalized/ Scheduled Bank and it shall be kept valid for a period of sixty

days beyond the date of completion of the Purchase Order. This Security Deposit will be returned to the Supplier only upon successful completion of all the contractual obligations or shall be adjusted/ forfeited against non-fulfilment of any of the contractual obligations. The Security Deposit shall be submitted within 30 days from the date of receipt of Purchase Order.

11. TEST CERTIFICATE:

Wherever required, test certificates should be sent along with the dispatch documents.

12. The Purchaser shall mean the President of India or his successors or assigns.

3. GENERAL TERMS AND CONDITONS

1. a) Facility of after sales service to be confirmed with details.

b) Permanent Account Number (PAN) allotted by Income-Tax authorities shall be furnished with documentary proof. Otherwise, documentary proof for having applied for PAN should be provided. Also PAN should be in the name of Company/Firm, if quoted by the Company/Firm and in the name of Individual, if quoted by individual.

c) GST No.

d) PAN No.

e) Local office in Tirunelveli / Nagercoil is preferable.

Note: (b) to (e) are applicable for Indian Companies only.

2. All amounts shall be indicated both in words as well as in figures. Where there is difference between amounts quoted in words and figures, amount quoted in words shall prevail.

3. GST where legally leviable and intended to be claimed should be distinctly shown separately in the tender.

4. Guarantee / Warranty period as applicable shall be indicated, along with the quote.

Guarantee/Warranty shall commence from the date of installation and acceptance of the complete equipment supplied under the contract/purchase order.

5. If an Indian agent submits bid on behalf of the Principal/OEM, the same Indian agent shall not submit a bid on behalf of another Principal/OEM in the same tender for the same item/product

6. In a tender, either the Indian Agent on behalf of the Principal/OEM or Principal/ OEM itself can bid but both cannot bid simultaneously for the same item/product in the same tender.

7. In case of imported items (stores), Ex-Works/FOB/FCA prices should be indicated. In case of indigenous stores the quotation should be on FOR-Destination / Door delivery basis.

8. In case the vendor falls in the category of Small Scale Industries(SSIs), who are registered with NSI, Public Sector Undertakings (PSUs) and Micro & Small Enterprises (MSMEs) the same shall be mentioned in their quote for evaluation.
9. Indian Agents while quoting on behalf of their principals shall attach necessary authorization letter from their Principals along with the bid.
10. IPRC reserves the right to accept or reject any quotation in full or part thereof by recording the reasons.
11. IPRC shall not be responsible for failure of vendors in submitting bids online caused due to technical reasons at vendor end such as network or power failures, computer failure, internet-browser, mistakes / errors in filling the bids on line by vendor etc.
12. ISRO PROPULSION COMPLEX (IPRC) is exempted from payment of Customs Duty under Notification No. 50/2017-Customs dated 30.06.2017 and as amended by Notification No.5/18 Customs dt:25/1/18. For imported items IPRC will provide Customs Duty Exemption Certificate for availing Concessional CD and IGST.
13. Last minute request for the extension of the due date w.r.t. any technical issue at Vendors/Suppliers side will not be considered. You may submit your quotation online well in advance instead of waiting till the last date to ensure that Internet problem and network condition does not cause problem
14. LIQUIDATED DAMAGES:Delivery is the essence of the contract. Items shall be delivered within stipulated period. If delivery is delayed beyond the stipulated delivery period mentioned in the purchase order or any extension thereof, an amount equal to 0.5% per week shall be recovered, subject to a maximum of 10% of the order value shall be deducted from your bills due.
15. Offers sent through post, telegram, fax, e-mail, courier will not be considered. Partially completed / incomplete tenders shall not be considered.
16. Only authorized dealers/agents or their accredited representatives for original manufacturers have to submit the quotation with documentary evidence.
17. PAYMENT: 100% through RTGS within 30 days from the date of receipt and acceptance of items at our site is the normal payment for Indigenous supply. In the case of direct Import, normal terms of payment are by Sight Draft / Wire Transfer after receipt of items. However, other terms of payment like establishment of Letter of Credit may be considered by the Purchaser on such terms and conditions as may be agreed upon.

18. PERFORMANCE BANK GUARANTEE :

The Supplier shall guarantee the successful and satisfactory performance/commissioning of equipment/machinery under the conditions specified in the Purchase Order. As a performance security, the SUPPLIER shall furnish a performance bank guarantee (format enclosed) from Nationalized Bank/Scheduled Bank for an amount equal to the sum of 3% of the order value ensuring the due performance of equipment/machinery in accordance with all the specifications and terms specified in the Purchase Order herein valid for the warranty period. On due performance, the performance bank guarantee shall be automatically cancelled and returned to the Supplier within 30 days after expiry of the Warranty period. The performance bank guarantee shall have claim period of six months.

19. SECURITY DEPOSIT : Security Deposit @ 3% of order value shall be submitted in the form of DD/FDR duly endorsed in favour of Accounts Officer, IPRC or by way of Bank Guarantee (in the prescribed format) within 20 days after receipt of order and valid up to the successful execution of the order.

20. The goods or material offered should be strictly as per our specifications. Change(s) in specifications, if any, should be clearly indicated by the supplier in his quotation. The supplier should also indicate make/type No. of the materials or equipment offered. Vague terms such as Best Indian, Best Indigenous and Imported make should not be used.

21. The offer should be valid for a minimum period of 120 days from the date of opening of the bids (Technical bid in case of 2-part tender).

22. The purchaser shall be under no obligation to accept the lowest or any tender and reserves the right of acceptance of the whole or any part of the tender or portions of the quantity offered and the tenderer shall supply the same at the rates quoted.

23. Wherever the tenderer is asked to submit sample for evaluation of tenders, the same shall be submitted along with your quote.

4. Conditions for BIDDER FROM A COUNTRY WHICH SHARES LAND BORDER WITH INDIA

1. Any false declaration and non-compliance of the above would be a ground for immediate rejection of offer or termination of the contract and further legal action in accordance with the laws.

2. As per the Rule 144(xi) of General Financial Rule, 2017, any bidder from a country which shares a land border with India will be eligible to bid in any procurement whether of goods, services (including consultancy services and non-consultancy services) or works (including turnkey projects) only if the bidder is registered with the competent authority i.e., Department for Promotion of Industry and Internal Trade (DPIIT).

3. Hence, Vendors or Agents of a Vendor (Indian or others) from a country sharing border with India shall submit copy of valid registration made with Department for Promotion of Industry and Internal Trade (DPIIT), Government of India along with the tender mandatorily, without which the offer will be treated as invalid.

4. Model Certificate for Tenders

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that this bidder is not from such a country or, if from such a country, has been registered with the Competent Authority. I hereby certify that this bidder fulfils all requirements in this regard and is eligible to be considered

5. Validity of Registration: Registration should be valid at the time of submission of bids and should be valid at the time of placement of order.

5. Format for Self Certification under Preference to MAKE IN INDIA Policy CERTIFICATE

1. In line with Government Public Procurement Order No. P-45021/2/2017-BE-II dt. 15.06.2017, as amended from time to time and as applicable on the date of submission of tender, we hereby certify that we M/s. _____(supplier name) are local supplier meeting the requirement of minimum percentage of Local content _____ (class I/Class II) as defined in above orders for the materials against Tender No. _____

2. Details of locations at which local value addition will be made is as follows:

3. We also understand, false declarations will be in breach of the Code in Integrity under Rule 175(1) (i) (h) of the General Financial Rule for which a bidder or its successors can be debarred for up two years as per Rule 151 (iii) of the General Financial Rules along with such other actions as may be permissible under law.

4. Seal and Signature of Authorized Signatory

6. GeM Seller ID

1. GeM Seller Registration: All vendors shall register themselves in GeM Portal (gem.gov.in) and provide GeM Seller unique ID in the tender documents, as this ID is mandatory for award of contract.

C. Bid Templates

C.1 Technical Bid - Non-lubricated Hydrogen gas compressors

1. COMPRESSOR: Non-lubricated Hydrogen gas compressors

Item specifications for COMPRESSOR

SI No	Specification	Value	Compliance	Offered Specification	Remark
1	SPECIFICATION OF NON-LUBRICATED HYDROGEN GAS COMPRESSORS		-		
2	Type of compressor	Horizontal/Vertical four stage non lubricated Hydrogen gas compressor. (Dry running) water cooled skid /foundation mounted Hydrogen gas compressor.	Yes / No / Explain		
3	Size of the Compressor	12.5 X 8.5 M wall to Wall Space available for Knock out drum, Compressor, After Cooler and Capacity Control Valve etc. The overall compressor system should be accommodated within this area.	Yes / No / Explain		

4	Gas composition	Wet Hydrogen gas: The input specification of GH2 is as follows: Hydrogen Purity : 98.5 % (min. by Volume) Oxygen : 50 ppmv max Nitrogen : 50 ppmv max CO : 5 ppmv max CO2 : 10 ppmv max CH4 : 5 ppmv max Alkalinity : 50 mg/m3 max Chlorides : NIL Water Vapour : Saturated with water at inlet gas conditions (0.5 % to 1.5 % by Vol)	Yes / No / Explain		
5	Quantity	2 nos.	Yes / No / Explain		
6	Cylinder Lubrication	Dry running, No oil.	Yes / No / Explain		
7	Schematic piping and Instrumentation diagram	To be submitted by the bidder along with their offer.	Yes / No / Explain		
8	Duty of compressor	Continuous and round the clock. Preservation action to be taken in case of idle condition for more than 15 days is to be specified in their offer.	Yes / No / Explain		
9	Suction pressure	1.03 bar (a)	Yes / No / Explain		
10	Delivery pressure	26.0 bar (a)	Yes / No / Explain		
11	Gas suction Temperature	Ambient, max 318 K	Yes / No / Explain		
12	Delivery temperature required	313 K (40 deg C)	Yes / No / Explain		
13	Capacity Required	Min 750 Nm3/hr.	Yes / No / Explain		

14	Operating range	The Compressor can be safely and continuously operated with a suction pressure of 1.03 bar (a) and discharge pressure of 26 bar (a).	Yes / No / Explain		
15	API 618 5th Edition	Generally as per API 618 5th Edition. Deviations if any are to be clearly listed.	Yes / No / Explain		
16	Features required (a)	Life of compressor should be equal to 25 years.	Yes / No / Explain		
17	Features required (b)	Sound level max 80 dB (A) in 1 m distance.	Yes / No / Explain		
18	Features required (c)	Conical strainer at Compressor inlet with piping spool piece for Hydrogen Gas of Min 100 micron nominal size or as required by compressor. Filter shall be in SS material.	Yes / No / Explain		
19	Features required (d)	Filter at Compressor outlet for Hydrogen Gas of 5 micron absolute size.	Yes / No / Explain		
20	Features required (e)	Safety relief valves in the suction, inter stage, and discharge circuits.	Yes / No / Explain		
21	Features required (f)	Drive components- Flywheel, Set of antistatic V-belts, Manual barring of compressor at flywheel.	Yes / No / Explain		
22	Features required (g)	Manual valves, check valves, anti static V belts and non sparking (Aluminium) V belt guard.	Yes / No / Explain		
23	Features required (h)	Check valve at the delivery GH2 line.	Yes / No / Explain		

24	Features required (i)	All gas passages to atmosphere such as the out let of safety relief valves, drain and vent valves shall be connected to a single common header by the supplier. ASL will connect this header with the plant stack.	Yes / No / Explain		
25	Features required (j)	Painting for outdoor corrosive installation.	Yes / No / Explain		
26	Pulsation Dampeners (a)	Suction, Inter stage & discharge gas bottles designed as per ASME Sec VIII DIV I.	Yes / No / Explain		
27	Pulsation Dampeners (b)	Design approval, Inspection and acceptance shall be carried out by reputed Third Party Inspection agency.	Yes / No / Explain		
28	Pulsation Dampeners (c)	Pulsation study and mechanical response analysis according API618 5th edition.	Yes / No / Explain		
29	Pulsation Dampeners (d)	Drain/Vent connection with valve.	Yes / No / Explain		
30	Inter Coolers	Inter stage coolers & oil cooler designed as per code ASME/TEMA/equivalent. Design approval, Inspection and Acceptance shall be carried out by reputed Third Party Inspection agency. Type - Shell & Tube, Removable tube bundle.	Yes / No / Explain		
31	Separator for liquid removal at I stage inlet (a)	Cyclone separator in stainless steel.	Yes / No / Explain		

32	Separator for liquid removal at I stage inlet (b)	Automatic liquid drainage, Automatic drainage with pneumatically operated soft seat valve operated via a 3-way solenoid valve, Level controller, floating type, built into the separator. Manual bypass consisting of shut-off and bypass valve.	Yes / No / Explain		
33	Compressor Stage valves	Type & Make of Valves (Plate / Ring / Poppet type) are to be specified.	Yes / No / Explain		
34	Lub oil system	Electric motor driven auxiliary oil pump for start up and compressor crank shaft driven main pump with Double oil filter (nominal filtration 10 micron & Filter cartridge in SS) casing of cast iron, with transfer valve and Differential pressure indicator (red / white).	Yes / No / Explain		
35	Material of construction (a)	Material of construction of Gas bottles shall be SS304/SS316/equivalent.	Yes / No / Explain		
36	Material of construction (b)	The tube bundle of all the coolers shall be made of stainless steel AISI type 2205. Duplex Alloy. UNS NO. S31803. The shell (water side) shall be Carbon steel.	Yes / No / Explain		
37	Material of construction (c)	Gas side materials, piping & fittings shall be made up of stainless steel 304 L /316L /321 / Equivalent.	Yes / No / Explain		
38	Material of construction (d)	Cylinder- Cast Iron.	Yes / No / Explain		
39	Material of construction (e)	Cylinder Liner- Cast Iron.	Yes / No / Explain		

40	Material of construction (f)	Piston Rod- Alloy Steel with rolled thread Polished for hydrogen leak tightness in stuffing box.	Yes / No / Explain		
41	Material of construction (g)	All Valves Body- carbon steel, Internals-SS	Yes / No / Explain		
42	Material of construction (h)	Piston rings, Guide rings, Stuffing sealing rings - Teflon carbon composite/polymer Proven for at least one year operation of compressor.	Yes / No / Explain		
43	Material of construction (i)	Make: Eagle seals (CPI) / Hoerbigger/ Compressor Manufacturer's proven materials.	Yes / No / Explain		
44	Distance Piece type	Double compartment distance piece. Crank case separated by two compartments at every stage, one with nitrogen purging and other for stuffing box packing end vented out.	Yes / No / Explain		
45	Capacity Control	Bypass control Valve from stage IV outlet to stage I inlet (suction) with range of 0-100%.	Yes / No / Explain		
46	After cooler	After cooler at the outlet of compressor suitable for the flow rate of 750 NM3/hr	Yes / No / Explain		

47	Cooling water System (a)	Forced closed loop Cooling water system required for the entire cooling water requirement of the Compressors package i.e. Intercoolers, Packing cooling, After Cooler, Oil Coolers etc with the accessories of water storage tank, water circulation pumps (1 working and 1 standby), plate heat exchanges (1w and 1s) to cool the circulation water with the cooling water (cooling water will be supplied by department) and necessary piping, valves, instrumentation required. All these instrumentation along with Pumps and water tank Level transmitter should be connected to mini PLC. In the above system DM water with pH correction will be circulated to avoid scale formation in the compressor coolers.	Yes / No / Explain		
48	Cooling water System (b)	Cooling water will be supplied by Department. Cooling water Piping & Fittings shall be made up of Stainless steel.	Yes / No / Explain		
49	II. DRIVE		-		
50	Type	Induction, Water/Air cooled.	Yes / No / Explain		
51	Duty	Continuous and round the clock basis.	Yes / No / Explain		
52	Power Supply	415 ±10% V, 50±4% Hz (by ASL)	Yes / No / Explain		
53	Insulation class	Class F.	Yes / No / Explain		

54	Explosive Protection for motor	Ex 'd' Zone 2 IIC T3 and IP55.	Yes / No / Explain		
55	Make	Bharat Bijlee/Crompton Greaves/ABB /Siemens/Scorch /Loher/Baldor.	Yes / No / Explain		
56	Recommended motor rating	160 KW @ 1500 RPM / To be specified by Bidder.	Yes / No / Explain		
57	Starter	Star delta / Heavy Duty Auto Transformer type Starter with Siemens Control Gear and necessary Motor Relay protection. This will be provided by Department	Yes / No / Explain		
58	Ambient climate	Hot, humid and tropical	Yes / No / Explain		
59	Winding Temp.	Winding Temp. based on Thermistors embedded in motor winding	Yes / No / Explain		
60	III. INSTRUMENTATION AND CONTROL SYSTEM		-		
61	Mini PLC or Compressor PLC (a)	A Mini PLC is to be provided at the control room (approx 80 meters from the compressor) for independent monitoring and incorporating safe trip logic of the Compressor with following interlocks :	Yes / No / Explain		
62	Mini PLC or Compressor PLC (b)	Display, trip and alarm of inlet pressure, delivery pressure and inlet stage and discharge temperature. All transmitters shall be SMART type with HART protocol.	Yes / No / Explain		
63	Mini PLC or Compressor PLC (c)	Flow switch, trip and alarm of low cooling water flow.	Yes / No / Explain		
64	Mini PLC or Compressor PLC (d)	Supervision of lube oil pressure.	Yes / No / Explain		

65	Mini PLC or Compressor PLC (e)	Over load trip based on amps.	Yes / No / Explain		
66	Mini PLC or Compressor PLC (f)	Winding temperature trip based on thermistors embedded in motor winding.	Yes / No / Explain		
67	Mini PLC or Compressor PLC (g)	All the Instruments installed in the compressor are to be connected to the Mini PLC. Suitable cables from compressor to mini PLC (100 meters) shall be provided	Yes / No / Explain		
68	Instrumentation and control system (a)	There are two PLC's. One is available with Main Plant referred as Main PLC and the other one is a Mini PLC for this compressor alone.	Yes / No / Explain		
69	Instrumentation and control system (b)	Mini PLC shall have Remote/Local modes selection option. When Remote Mode is selected, the compressor can be started/stopped from Main PLC and in the Local mode, the Compressor can be started/stopped from the Mini PLC.	Yes / No / Explain		

70	Instrumentation and control system (c)	For START/STOP from the Main PLC, 2 Nos. of Digital Output is available in Main PLC. The Mini PLC shall take this input signal for compressor START/STOP. Mini PLC is to be configured in such a way that by taking START/STOP command from Main PLC, the Compressor has to START/STOP through Mini PLC safely complying trip logic of compressor. In case of the trip of the plant in Main PLC, the digital output shall stop the compressor. In this case, the Mini PLC has to be put on Remote mode.	Yes / No / Explain		
71	Instrumentation and control system (d)	Main PLC can take 1 No. of Digital Input for receiving the compressor Running / Trip status from Mini PLC. Hence, Mini PLC needs to be configured accordingly to send status signal from Mini PLC to Main PLC. Based on this signal, if the compressor is not running, the Main PLC will trip the plant.	Yes / No / Explain		
72	Instrumentation and control system (e)	Provision is required for independent TRIP of the compressor on safety interlocks from the Mini PLC as well as plant emergency push button even when the compressor started from Main PLC/ Mini PLC.	Yes / No / Explain		
73	IV. LOCAL GAUGES /REMOTE INSTRUMENTS		-		

74	Field instruments	suitable for Gas group IIc and EExi design shall be provided as per following list:	Yes / No / Explain		
75	Field Instruments (a)	Lube oil pressure Gauge.	Yes / No / Explain		
76	Field Instruments (b)	Lube oil level gauge and oil temperature gauge. (in the sump).	Yes / No / Explain		
77	Field Instruments (c)	Sight glass at the outlet of the oil overflow valve.	Yes / No / Explain		
78	Field Instruments (d)	Cooling water inlet & outlet pressure and temperature gauges.	Yes / No / Explain		
79	Field Instruments (e)	Temperature indicator up and downstream of each gas cooler, each Cylinder water outlet, frame oil temperature inlet.	Yes / No / Explain		
80	Field Instruments (f)	Gaseous Hydrogen inlet, inter stage and outlet temperature gauges.	Yes / No / Explain		
81	Field Instruments (g)	Cooling water flow switches in the water return line of each intercooler.	Yes / No / Explain		
82	Field Instruments (h)	Any other instruments as per vendor specification.	Yes / No / Explain		
83	Field Instruments (i)	Safety relief valve in the Hydrogen gas suction, inter stage and discharge line.	Yes / No / Explain		
84	Field Instruments (j)	Local Start /Emergency Stop switch.	Yes / No / Explain		
85	Field Instruments (k)	Local Start/Stop Push button station.	Yes / No / Explain		
86	Field Instruments (l)	Housing Suitable for Area Classification installed near compressor EXdIIcT3.	Yes / No / Explain		
87	Field Instruments (m)	All the above are to be connected to the Mini PLC only for display and control.	Yes / No / Explain		

88	Field Instruments (n)	Junction Box at battery Limit.: Flame proof Junction Box (EXdIIcT3) installed near compressor suitable for Gas group IIc and EExi design and Signal / Control cables required upto Compressor PLC will be in Vendor scope only. (Approx. Distance will be 75 Mts). Compressor Mini PLC will be placed in Control Room.	Yes / No / Explain		
89	V. INSPECTION AND TESTING PLAN		-		
90	Inspection & testing (a)	Inspection and Testing at Supplier's work	Yes / No / Explain		
91	Inspection & testing (b)	Inspection and testing of GH2 compressor shall be carried out by supplier at their works in the presence of IPRC engineers. Mechanical test run (no load) shall be carried out as per API 618 5th Edition or equivalent. The compressor performance shall be demonstrated by supplier at SLHP, ASL, Saggonda.	Yes / No / Explain		
92	Inspection & testing (c)	The Inspection and Testing as per API 618 5th Edition and certificates shall be furnished to IPRC Engineers during test run for obtaining dispatch clearance.	Yes / No / Explain		
93	Inspection & testing (d)	Material Inspection- Non destructive examinations/ Radiographic examinations.	Yes / No / Explain		
94	Inspection & testing (e)	Mechanical Inspection.	Yes / No / Explain		

95	Inspection & testing (f)	Material test certificates (chemical analysis and mechanical properties) for pressure containing parts.	Yes / No / Explain		
96	Inspection & testing (g)	Hydrostatic and Gas Leakage Tests as per API 618 5th Edition. Helium leak tests (Bubble leak tightness test) for compressor cylinders.	Yes / No / Explain		
97	Inspection & testing (h)	Mechanical Running Test	Yes / No / Explain		
98	Inspection & testing (i)	All compressor suction and discharge cylinder valves shall be leak-tested in accordance with the vendor's standard procedure.	Yes / No / Explain		
99	Inspection & testing (j)	Piston end clearances and rod run out.	Yes / No / Explain		
100	Inspection & testing (k)	Piston rings, rider rings, stuffing box sealing rings clearance chart showing clearance of new ring, measured clearance of fitted rings and limiting values.	Yes / No / Explain		
101	Inspection & testing (l)	Third party inspection certificate of acceptance for Gas bottles, Inter Coolers, Oil cooler and safety valves.	Yes / No / Explain		
102	Inspection & testing (m)	Global Leak tightness test of assembled compressor unit.	Yes / No / Explain		
103	Inspection & testing (n)	Inspection (dimensional & visual) after test run / Dismantle check. Noise level check.	Yes / No / Explain		
104	Inspection & testing (o)	Conformity certificate issued by PTB / equivalent authority for electrical instruments, control cabinets, electric motor, sensors and acoustic signal.	Yes / No / Explain		

105	Inspection & testing (p)	Manufacturer's test certificates for all bought out items.	Yes / No / Explain		
106	VI. ACCESSORIES AND SPARE		-		
107	Scope of supplier (a)	The supply & scope of work shall also include the following:	Yes / No / Explain		
108	Scope of supplier (b)	Foundation bolts and nuts.	Yes / No / Explain		
109	Scope of supplier (c)	Spare parts for commissioning the GH2 compressor at SLHP, ASL, Saggonda shall be in the scope of the supplier. List of Commissioning spares are to be indicated in the offer.	Yes / No / Explain		
110	Scope of supplier (d)	Special Tools like Protective cone for piston rod pull in, Hydraulic Device for disassembling of the cross-head pin if required, Special Hexagon socket for torque wrench for piston if required etc... and any other special tool required for site maintenance of the compressor.	Yes / No / Explain		
111	Scope of supplier (e)	The Bidder shall furnish complete details of the loads on the foundation for designing the foundation & Lube oil grade and Quantity within one month in case of award of order.	Yes / No / Explain		
112	Scope of supplier (f)	As built P & I diagram and electrical wiring diagram.	Yes / No / Explain		
113	Scope of supplier (g)	Three sets of Operation and maintenance manual in English Language including spare parts List and vendor's literatures for the bought out item both Soft form and Hard copy.	Yes / No / Explain		

114	Scope of supplier (h)	The Bidder shall quote for the List of Spare parts required for 2 years of trouble free Operation & maintenance and mention the part number of spare parts.	Yes / No / Explain		
115	Scope of supplier (i)	Guarantee period for 12 months from the date of successful commissioning or 18 months from the date of delivery.	Yes / No / Explain		
116	Scope of supplier (j)	Performance bank guarantee for 10% of the order value valid till the expiry of the guarantee period.	Yes / No / Explain		
117	Scope of supplier (k)	Supervision of Erection and commissioning. The Supplier has to demonstrate the complete performance of the compressor after installation at ASL, Saggonda.	Yes / No / Explain		
118	Scope of supplier (l)	Supplier has to assure for providing spares and supports for another 20 years for trouble free operation and maintenance of compressors.	Yes / No / Explain		
119	VII. Flow components & instruments		-		
120	Flow components & instruments	It shall be of reputed make and furnish relevant test certificates. The make shall be mentioned by supplier.	Yes / No / Explain		
121	Safety valve	Sebim/Tyco/Fainger Leser/Heroes GmbH.	Yes / No / Explain		
122	Pressure Gauges	Samson/Wika/Burton /Crystal/Genaral/H-guru.	Yes / No / Explain		
123	Compressor valves	Eagle seals (CPI)/Compressor manufacturers /Hoerbigger	Yes / No / Explain		

124	Pressure transmitter	Yokogawa/Rosemount/Honeywell/Siemens/Smar/ABB/Fuge.	Yes / No / Explain		
125	Temperature transmitter	Yokogawa/Rosemount/Honeywell/Siemens/Smar/ABB	Yes / No / Explain		
126	Valves (Manual & Control valves):	Samson/Flow Serve/Velan/MIL/Weka / Instrumentation Ltd.	Yes / No / Explain		
127	Filters	Ultrafilters/Puronics/Millipore/Cryodiffusion/Novintec/Shavo Technologies representing classic filters, UK/Doonaldson	Yes / No / Explain		
128	PLC	Siemens/Allendradley/Modicon/B&R/Sigmatec/Honeywell.	Yes / No / Explain		
129	Instruments	Fitting Swagelok/Parker/DK Lok/Panam, Tubing: Material grade ASTM A213/A 269 TP 304L ASTM A213/A 269 SS 304L, Solenoid valves: AVCON, ASCON, Rotex, Parker, Burkert	Yes / No / Explain		
130	Pipes & pipe fittings	Rajendra/Ratnamani/Nuclear fuel complex/Sandvik/Prakash Steelage/Maharashtra seamless.	Yes / No / Explain		
131	Heat Exchangers	Funke, Germany, Patels air temperature India pvt. Ltd. Ahmedabad, Naga Hitech, Chennai	Yes / No / Explain		

132	Compliance on flow components	The make of flow component mentioned in tender is only preferable. If the party specifically suggests any other make, which should be clearly indicated in the quotation. IPRC has the rights to rejects or accepts the new vendor suggested by compressor supplier after detailed review. If IPRC is not accepted the new vendor as suggested, compressor supplier should accept and supply above mentioned make of flow components only without any additional financial implication. Compressor's supplier should comply this clause.	Yes / No / Explain		
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Document : Terms and conditions

Document : Specification of compressors

2. COMPRESSOR: Supervision charges per day person for erection & commissioning at SLHP, ASL, Saggonda

3. TRANSPORTATION CHARGES: Up to SLHP, The Andhra Sugars Limited, Saggonda, Andhra Pradesh

Common Specifications (Applicable for all items)

SI No	Specification	Value	Compliance	Offered Specification	Remark
1	Features required (f)	Drive components- Flywheel, Set of antistatic V-belts, Manual barring of compressor at flywheel.	Yes / No / Explain		

2	Type of compressor	Horizontal/Vertical four stage non lubricated Hydrogen gas compressor. (Dry running) water cooled skid /foundation mounted Hydrogen gas compressor.	Yes / No / Explain		
3	Size of the Compressor	12.5 X 8.5 M wall to Wall Space available for Knock out drum, Compressor, After Cooler and Capacity Control Valve etc. The overall compressor system should be accommodated within this area.	Yes / No / Explain		
4	Gas composition	Wet Hydrogen gas: The input specification of GH2 is as follows: Hydrogen Purity : 98.5 % (min. by Volume) Oxygen : 50 ppmv max Nitrogen : 50 ppmv max CO : 5 ppmv max CO2 : 10 ppmv max CH4 : 5 ppmv max Alkalinity : 50 mg/m3 max Chlorides : NIL Water Vapour : Saturated with water at inlet gas conditions (0.5 % to 1.5 % by Vol)	Yes / No / Explain		
5	Quantity	2 nos.	Yes / No / Explain		
6	Cylinder Lubrication	Dry running, No oil.	Yes / No / Explain		
7	Schematic piping and Instrumentation diagram	To be submitted by the bidder along with their offer.	Yes / No / Explain		
8	Duty of compressor	Continuous and round the clock. Preservation action to be taken in case of idle condition for more than 15 days is to be specified in their offer.	Yes / No / Explain		

9	Suction pressure	1.03 bar (a)	Yes / No / Explain		
10	Delivery pressure	26.0 bar (a)	Yes / No / Explain		
11	Gas suction Temperature	Ambient, max 318 K	Yes / No / Explain		
12	Delivery temperature required	313 K (40 deg C)	Yes / No / Explain		
13	Capacity Required	Min 750 Nm ³ /hr.	Yes / No / Explain		
14	Operating range	The Compressor can be safely and continuously operated with a suction pressure of 1.03 bar (a) and discharge pressure of 26 bar (a).	Yes / No / Explain		
15	API 618 5th Edition	Generally as per API 618 5th Edition. Deviations if any are to be clearly listed.	Yes / No / Explain		
16	Features required (a)	Life of compressor should be equal to 25 years.	Yes / No / Explain		
17	Features required (b)	Sound level max 80 dB (A) in 1 m distance.	Yes / No / Explain		
18	Features required (c)	Conical strainer at Compressor inlet with piping spool piece for Hydrogen Gas of Min 100 micron nominal size or as required by compressor. Filter shall be in SS material.	Yes / No / Explain		
19	Features required (d)	Filter at Compressor outlet for Hydrogen Gas of 5 micron absolute size.	Yes / No / Explain		
20	Features required (e)	Safety relief valves in the suction, inter stage, and discharge circuits.	Yes / No / Explain		

21	Terms and Conditions 1: Scope of work	Design, Fabrication, Shop testing, transportation to ASL, Saggonda, Supply of Non-Lubricated Hydrogen gas compressors, Supervision of Erection & commissioning and Demonstration of performance at Second Liquid Hydrogen Plant (SLHP), ASL, Saggonda, West Godavari Dist., Andhra Pradesh as per Technical Specification.	Yes / No / Explain		
22	Features required (g)	Manual valves, check valves, anti static V belts and non sparking (Aluminium) V belt guard.	Yes / No / Explain		
23	Features required (h)	Check valve at the delivery GH2 line.	Yes / No / Explain		
24	Features required (i)	All gas passages to atmosphere such as the out let of safety relief valves, drain and vent valves shall be connected to a single common header by the supplier. ASL will connect this header with the plant stack.	Yes / No / Explain		
25	Features required (j)	Painting for outdoor corrosive installation.	Yes / No / Explain		
26	Pulsation Dampeners (a)	Suction, Inter stage & discharge gas bottles designed as per ASME Sec VIII DIV I.	Yes / No / Explain		
27	Pulsation Dampeners (b)	Design approval, Inspection and acceptance shall be carried out by reputed Third Party Inspection agency.	Yes / No / Explain		
28	Pulsation Dampeners (c)	Pulsation study and mechanical response analysis according API618 5th edition.	Yes / No / Explain		
29	Pulsation Dampeners (d)	Drain/Vent connection with valve.	Yes / No / Explain		

30	Inter Coolers	Inter stage coolers & oil cooler designed as per code ASME/TEMA/equivalent. Design approval, Inspection and Acceptance shall be carried out by reputed Third Party Inspection agency. Type - Shell & Tube, Removable tube bundle.	Yes / No / Explain		
31	Separator for liquid removal at I stage inlet (a)	Cyclone separator in stainless steel.	Yes / No / Explain		
32	Separator for liquid removal at I stage inlet (b)	Automatic liquid drainage, Automatic drainage with pneumatically operated soft seat valve operated via a 3-way solenoid valve, Level controller, floating type, built into the separator. Manual bypass consisting of shut-off and bypass valve.	Yes / No / Explain		
33	Compressor Stage valves	Type & Make of Valves (Plate / Ring / Poppet type) are to be specified.	Yes / No / Explain		
34	Lub oil system	Electric motor driven auxiliary oil pump for start up and compressor crank shaft driven main pump with Double oil filter (nominal filtration 10 micron & Filter cartridge in SS) casing of cast iron, with transfer valve and Differential pressure indicator (red / white).	Yes / No / Explain		
35	Material of construction (a)	Material of construction of Gas bottles shall be SS304/SS316/equivalent.	Yes / No / Explain		
36	Material of construction (b)	The tube bundle of all the coolers shall be made of stainless steel AISI type 2205. Duplex Alloy. UNS NO. S31803. The shell (water side) shall be Carbon steel.	Yes / No / Explain		

37	Material of construction (c)	Gas side materials, piping & fittings shall be made up of stainless steel 304 L /316L /321 / Equivalent.	Yes / No / Explain		
38	Material of construction (d)	Cylinder- Cast Iron.	Yes / No / Explain		
39	Material of construction (e)	Cylinder Liner- Cast Iron.	Yes / No / Explain		
40	Material of construction (f)	Piston Rod- Alloy Steel with rolled thread Polished for hydrogen leak tightness in stuffing box.	Yes / No / Explain		
41	Material of construction (g)	All Valves Body- carbon steel, Internals- SS	Yes / No / Explain		
42	Material of construction (h)	Piston rings, Guide rings, Stuffing sealing rings - Teflon carbon composite/polymer Proven for at least one year operation of compressor.	Yes / No / Explain		
43	Material of construction (i)	Make: Eagle seals (CPI) / Hoerbigger/ Compressor Manufacturer's proven materials.	Yes / No / Explain		
44	Distance Piece type	Double compartment distance piece. Crank case separated by two compartments at every stage, one with nitrogen purging and other for stuffing box packing end vented out.	Yes / No / Explain		
45	Capacity Control	Bypass control Valve from stage IV outlet to stage I inlet (suction) with range of 0-100%.	Yes / No / Explain		
46	After cooler	After cooler at the outlet of compressor suitable for the flow rate of 750 NM3/hr	Yes / No / Explain		
47	SPECIFICATION OF NON-LUBRICATED HYDROGEN GAS COMPRESSORS		-		

48	T&C10: Documentation	The following documents are to be submitted along with the consignment: All test certificates including bought out items, Warranty certificate, Operation and maintenance manual (3 sets) and Spare parts list with part number and detailed drawing	Yes / No / Explain		
49	T&C9: Documentation	The following documents are to be submitted soon after placement of order: Final P&ID and general assembly drawing, The details of foundation required with loads, Final list of sub vendors with the details of scope of supply, Quality Assurance plan and Schedule chart.	Yes / No / Explain		
50	T&C8: Key criteria	The supplier must furnish the list of companies to whom non-lubricated Hydrogen gas compressors of similar specifications / equivalent were supplied during last five years along with copies of purchase orders and third party inspection agency's release notes. This will be considered as key criteria for evaluation of Technical bid and capability. If these details are not given, the offer may not be considered for evaluation. In addition to above, the details of various compressor supplied in India shall also furnish.	Yes / No / Explain		

51	T&C7: Pre-delivery inspection and Dispatch	The compressor will be dispatched from the supplier's work only after carrying out Pre delivery inspection by ASL & IPRC engineers and obtaining the dispatch clearance from Department.	Yes / No / Explain		
52	T&C6: Schedule	The detailed schedule shall be clearly indicated in the offer.	Yes / No / Explain		
53	T&C5: Delivery	Item shall be packed in good condition to avoid transit damage and deliver at SLHP, The Andhra Sugars Limited, Saggonda, East Godavari dist, Andhra pradesh.	Yes / No / Explain		
54	T&C4: Erection and Commissioning	The supplier shall supervise the erection and commissioning of the compressor at SLHP, ASL, Saggonda. The supplier shall demonstrate the compressor performance like pressure, flow, power and other utility consumption. The Compressor will be accepted by Department only after successful commissioning with Hydrogen gas at SLHP.	Yes / No / Explain		
55	T&C3: Quotation validity	Quotation for non-lubricated Hydrogen gas compressors should have a minimum validity period of 6 months from the date of tender opening	Yes / No / Explain		
56	T&C 2	The supplier shall submit the bid in two parts: One technical bid including commercial terms & conditions and all other information without mentioning price and second part is price bid.	Yes / No / Explain		

57	Cooling water System (a)	Forced closed loop Cooling water system required for the entire cooling water requirement of the Compressors package i.e. Intercoolers, Packing cooling, After Cooler, Oil Coolers etc with the accessories of water storage tank, water circulation pumps (1 working and 1 standby), plate heat exchanges (1w and 1s) to cool the circulation water with the cooling water (cooling water will be supplied by department) and necessary piping, valves, instrumentation required. All these instrumentation along with Pumps and water tank Level transmitter should be connected to mini PLC. In the above system DM water with pH correction will be circulated to avoid scale formation in the compressor coolers.	Yes / No / Explain		
58	Cooling water System (b)	Cooling water will be supplied by Department. Cooling water Piping & Fittings shall be made up of Stainless steel.	Yes / No / Explain		
59	II. DRIVE		-		
60	Type	Induction, Water/Air cooled.	Yes / No / Explain		
61	Duty	Continuous and round the clock basis.	Yes / No / Explain		
62	Power Supply	415 ±10% V, 50±4% Hz (by ASL)	Yes / No / Explain		
63	Insulation class	Class F.	Yes / No / Explain		
64	Explosive Protection for motor	Ex 'd' Zone 2 IIC T3 and IP55.	Yes / No / Explain		

65	Make	Bharat Bijlee/Crompton Greaves/ABB /Siemens/Scorch /Loher/Baldor.	Yes / No / Explain		
66	Recommended motor rating	160 KW @ 1500 RPM / To be specified by Bidder.	Yes / No / Explain		
67	Starter	Star delta / Heavy Duty Auto Transformer type Starter with Siemens Control Gear and necessary Motor Relay protection. This will be provided by Department	Yes / No / Explain		
68	Ambient climate	Hot, humid and tropical	Yes / No / Explain		
69	Winding Temp.	Winding Temp. based on Thermistors embedded in motor winding	Yes / No / Explain		
70	III. INSTRUMENT ATION AND CONTROL SYSTEM		-		
71	Mini PLC or Compressor PLC (a)	A Mini PLC is to be provided at the control room (approx 80 meters from the compressor) for independent monitoring and incorporating safe trip logic of the Compressor with following interlocks :	Yes / No / Explain		
72	Mini PLC or Compressor PLC (b)	Display, trip and alarm of inlet pressure, delivery pressure and inlet stage and discharge temperature. All transmitters shall be SMART type with HART protocol.	Yes / No / Explain		
73	Mini PLC or Compressor PLC (c)	Flow switch, trip and alarm of low cooling water flow.	Yes / No / Explain		
74	Mini PLC or Compressor PLC (d)	Supervision of lube oil pressure.	Yes / No / Explain		
75	Mini PLC or Compressor PLC (e)	Over load trip based on amps.	Yes / No / Explain		

76	Mini PLC or Compressor PLC (f)	Winding temperature trip based on thermistors embedded in motor winding.	Yes / No / Explain		
77	Mini PLC or Compressor PLC (g)	All the Instruments installed in the compressor are to be connected to the Mini PLC. Suitable cables from compressor to mini PLC (100 meters) shall be provided	Yes / No / Explain		
78	Instrumentation and control system (a)	There are two PLC's. One is available with Main Plant referred as Main PLC and the other one is a Mini PLC for this compressor alone.	Yes / No / Explain		
79	Instrumentation and control system (b)	Mini PLC shall have Remote/Local modes selection option. When Remote Mode is selected, the compressor can be started/stopped from Main PLC and in the Local mode, the Compressor can be started/stopped from the Mini PLC.	Yes / No / Explain		
80	Instrumentation and control system (c)	For START/STOP from the Main PLC, 2 Nos. of Digital Output is available in Main PLC. The Mini PLC shall take this input signal for compressor START/STOP. Mini PLC is to be configured in such a way that by taking START/STOP command from Main PLC, the Compressor has to START/STOP through Mini PLC safely complying trip logic of compressor. In case of the trip of the plant in Main PLC, the digital output shall stop the compressor. In this case, the Mini PLC has to be put on Remote mode.	Yes / No / Explain		

81	Instrumentation and control system (d)	Main PLC can take 1 No. of Digital Input for receiving the compressor Running / Trip status from Mini PLC. Hence, Mini PLC needs to be configured accordingly to send status signal from Mini PLC to Main PLC. Based on this signal, if the compressor is not running, the Main PLC will trip the plant.	Yes / No / Explain		
82	Instrumentation and control system (e)	Provision is required for independent TRIP of the compressor on safety interlocks from the Mini PLC as well as plant emergency push button even when the compressor started from Main PLC/ Mini PLC.	Yes / No / Explain		
83	IV. LOCAL GAUGES /REMOTE INSTRUMENTS		-		
84	Field instruments	suitable for Gas group IIc and EExi design shall be provided as per following list:	Yes / No / Explain		
85	Field Instruments (a)	Lube oil pressure Gauge.	Yes / No / Explain		
86	Field Instruments (b)	Lube oil level gauge and oil temperature gauge. (in the sump).	Yes / No / Explain		
87	Field Instruments (c)	Sight glass at the outlet of the oil overflow valve.	Yes / No / Explain		
88	Field Instruments (d)	Cooling water inlet & outlet pressure and temperature gauges.	Yes / No / Explain		
89	Field Instruments (e)	Temperature indicator up and downstream of each gas cooler, each Cylinder water outlet, frame oil temperature inlet.	Yes / No / Explain		
90	Field Instruments (f)	Gaseous Hydrogen inlet, inter stage and outlet temperature gauges.	Yes / No / Explain		
91	Field Instruments (g)	Cooling water flow switches in the water return line of each intercooler.	Yes / No / Explain		

92	Field Instruments (h)	Any other instruments as per vendor specification.	Yes / No / Explain		
93	Field Instruments (i)	Safety relief valve in the Hydrogen gas suction, inter stage and discharge line.	Yes / No / Explain		
94	Field Instruments (j)	Local Start /Emergency Stop switch.	Yes / No / Explain		
95	Field Instruments (k)	Local Start/Stop Push button station.	Yes / No / Explain		
96	Field Instruments (l)	Housing Suitable for Area Classification installed near compressor EXdIIcT3.	Yes / No / Explain		
97	Field Instruments (m)	All the above are to be connected to the Mini PLC only for display and control.	Yes / No / Explain		
98	Field Instruments (n)	Junction Box at battery Limit.: Flame proof Junction Box (EXdIIcT3) installed near compressor suitable for Gas group IIc and EExi design and Signal / Control cables required upto Compressor PLC will be in Vendor scope only. (Approx. Distance will be 75 Mts). Compressor Mini PLC will be placed in Control Room.	Yes / No / Explain		
99	V. INSPECTION AND TESTING PLAN		-		
100	Inspection & testing (a)	Inspection and Testing at Supplier's work	Yes / No / Explain		

101	Inspection & testing (b)	Inspection and testing of GH2 compressor shall be carried out by supplier at their works in the presence of IPRC engineers. Mechanical test run (no load) shall be carried out as per API 618 5th Edition or equivalent. The compressor performance shall be demonstrated by supplier at SLHP, ASL, Saggonda.	Yes / No / Explain		
102	Inspection & testing (c)	The Inspection and Testing as per API 618 5th Edition and certificates shall be furnished to IPRC Engineers during test run for obtaining dispatch clearance.	Yes / No / Explain		
103	Inspection & testing (d)	Material Inspection- Non destructive examinations/ Radiographic examinations.	Yes / No / Explain		
104	Inspection & testing (e)	Mechanical Inspection.	Yes / No / Explain		
105	Inspection & testing (f)	Material test certificates (chemical analysis and mechanical properties) for pressure containing parts.	Yes / No / Explain		
106	Inspection & testing (g)	Hydrostatic and Gas Leakage Tests as per API 618 5th Edition. Helium leak tests (Bubble leak tightness test) for compressor cylinders.	Yes / No / Explain		
107	Inspection & testing (h)	Mechanical Running Test	Yes / No / Explain		
108	Inspection & testing (i)	All compressor suction and discharge cylinder valves shall be leak-tested in accordance with the vendor's standard procedure.	Yes / No / Explain		
109	Inspection & testing (j)	Piston end clearances and rod run out.	Yes / No / Explain		

110	Inspection & testing (k)	Piston rings, rider rings, stuffing box sealing rings clearance chart showing clearance of new ring, measured clearance of fitted rings and limiting values.	Yes / No / Explain		
111	Inspection & testing (l)	Third party inspection certificate of acceptance for Gas bottles, Inter Coolers, Oil cooler and safety valves.	Yes / No / Explain		
112	Inspection & testing (m)	Global Leak tightness test of assembled compressor unit.	Yes / No / Explain		
113	Inspection & testing (n)	Inspection (dimensional & visual) after test run / Dismantle check. Noise level check.	Yes / No / Explain		
114	Inspection & testing (o)	Conformity certificate issued by PTB / equivalent authority for electrical instruments, control cabinets, electric motor, sensors and acoustic signal.	Yes / No / Explain		
115	Inspection & testing (p)	Manufacturer's test certificates for all bought out items.	Yes / No / Explain		
116	VI. ACCESSORIES AND SPARE		-		
117	Scope of supplier (a)	The supply & scope of work shall also include the following:	Yes / No / Explain		
118	Scope of supplier (b)	Foundation bolts and nuts.	Yes / No / Explain		
119	Scope of supplier (c)	Spare parts for commissioning the GH2 compressor at SLHP, ASL, Saggonda shall be in the scope of the supplier. List of Commissioning spares are to be indicated in the offer.	Yes / No / Explain		

120	Scope of supplier (d)	Special Tools like Protective cone for piston rod pull in, Hydraulic Device for disassembling of the cross-head pin if required, Special Hexagon socket for torque wrench for piston if required etc... and any other special tool required for site maintenance of the compressor.	Yes / No / Explain		
121	Scope of supplier (e)	The Bidder shall furnish complete details of the loads on the foundation for designing the foundation & Lube oil grade and Quantity within one month in case of award of order.	Yes / No / Explain		
122	Scope of supplier (f)	As built P & I diagram and electrical wiring diagram.	Yes / No / Explain		
123	Scope of supplier (g)	Three sets of Operation and maintenance manual in English Language including spare parts List and vendor's literatures for the bought out item both Soft form and Hard copy.	Yes / No / Explain		
124	Scope of supplier (h)	The Bidder shall quote for the List of Spare parts required for 2 years of trouble free Operation & maintenance and mention the part number of spare parts.	Yes / No / Explain		
125	Scope of supplier (i)	Guarantee period for 12 months from the date of successful commissioning or 18 months from the date of delivery.	Yes / No / Explain		
126	Scope of supplier (j)	Performance bank guarantee for 10% of the order value valid till the expiry of the guarantee period.	Yes / No / Explain		

127	Scope of supplier (k)	Supervision of Erection and commissioning. The Supplier has to demonstrate the complete performance of the compressor after installation at ASL, Saggonda.	Yes / No / Explain		
128	Scope of supplier (l)	Supplier has to assure for providing spares and supports for another 20 years for trouble free operation and maintenance of compressors.	Yes / No / Explain		
129	VII. Flow components & instruments		-		
130	Flow components & instruments	It shall be of reputed make and furnish relevant test certificates. The make shall be mentioned by supplier.	Yes / No / Explain		
131	Safety valve	Sebim/Tyco/Fainger Leser/Heroes Gmbh.	Yes / No / Explain		
132	Pressure Gauges	Samson/Wika/Burton/Crystal/Genaral/H-guru.	Yes / No / Explain		
133	Compressor valves	Eagle seals (CPI)/Compressor manufacturers /Hoerbigger	Yes / No / Explain		
134	Pressure transmitter	Yokogawa/Rosemount /Honeywell/Siemens/Smar/ABB/Fuge.	Yes / No / Explain		
135	Temperature transmitter	Yokogawa/Rosemount /Honeywell/Siemens/Smar/ABB	Yes / No / Explain		
136	Valves (Manual & Control valves):	Samson/Flow Serve/Velan/MIL/Weka / Instrumentation Ltd.	Yes / No / Explain		
137	Filters	Ultrafilters/Puronic/Millipore/Cryodiffusion/Novintec/Shavo Technologies representing classic filters, UK/Doonaldson	Yes / No / Explain		
138	PLC	Siemens/Allendradley/Modicon/B&R/Sigmatic /Honeywell.	Yes / No / Explain		

139	Instruments	Fitting Swagelok/Parker/DK Lok/Panam, Tubing: Material grade ASTM A213/A 269 TP 304L ASTM A213/A 269 SS 304L, Solenoid valves: AVCON, ASCON, Rotex, Parker, Burkert	Yes / No / Explain		
140	Pipe and pipe fittings	Rajendra/Ratnamani/Nuclear fuel complex/Sandvik/Prakash Steelage/Maharashtra seamless	Yes / No / Explain		
141	Heat Exchangers	Funke, Germany, Patels air temperature India pvt. Ltd. Ahmedabad, Naga Hitech, Chennai	Yes / No / Explain		
142	Compliance on flow components	The make of flow component mentioned in tender is only preferable. If the party specifically suggests any other make, which should be clearly indicated in the quotation. IPRC has the rights to rejects or accepts the new vendor suggested by compressor supplier after detailed review. If IPRC is not accepted the new vendor as suggested, compressor supplier should accept and supply above mentioned make of flow components only without any additional financial implication. Compressor's supplier should comply this clause.	Yes / No / Explain		

Supporting Documents required from Vendor

1. Compliance of Technical specification

2. Detailed specification of compressor

3. Details of make of flow components other than prescribed for scrutiny

4. Additional details if any

5. General arrangement drawing of compressor

6. Price bid related documents (Price Bid Related)

7. Compliance of terms and conditions.

8. Previous purchase orders of compressors.

9. Details of suppliers company alongwith ISO certification if any.

10. Additional details if any

5 additional documents can be uploaded by the vendor

C.2 Commercial Terms / Bid

Sl. No.	Description	Compliance	Vendor Terms
1	The make of flow components other than prescribed should be justified by compressor supplier. IPRC has the right to reject or accept the flow components other than prescribed.	Yes / No / Explain	
2	The make of flow component is only preferable which is mentioned in specification.	Yes / No / Explain	
3	Item will be delivered at Second Liquid Hydrogen Plant (SLHP), ASL, Saggonda, East Godavari dist., Andhra Pradesh.	Yes / No / Explain	
4	Item should be packed in good condition to avoid any transit damages.	Yes / No / Explain	
5	Item will be delivered only after obtaining dispatch clearnace from IPRC, Mahendragir.	Yes / No / Explain	
6	Compressors performance shall be demonstrated as per technical specification at SLHP, ASL, Saggonda.	Yes / No / Explain	
7	Inspection and testing of compressors shall be carried out at suppliers works in the presence of IPRC engineers.	Yes / No / Explain	
8	Mechanical test run at suppliers works shall be carried out as per API 618 5th edition or equivalent.	Yes / No / Explain	
9	Spare parts for commissioning of compressors at SLHP, ASL, Saggonda shall be provided.	Yes / No / Explain	
10	The supplier shall quote for the list of spare parts required for 2 years of trouble free operation & maintenance of compressors and mention the part number of spare parts.	Yes / No / Explain	
11	Validity of Offer (specify)	Yes / No / Explain	
12	Delivery Period (specify)	Yes / No / Explain	
13	Delivery Terms: Normal delivery terms - FOR Destination (i.e., IPRC, Mahendragiri)	Yes / No / Explain	
14	Payment Terms: 100% within 30 days after receipt and acceptance of items (No advance payment is acceptable). Specify your Payment Terms.	Yes / No / Explain	

15	Security Deposit: The Supplier shall provide Bank Guarantee for an amount equivalent to the 3% (THREE PERCENT) of the total Order value towards Security Deposit for the due performance of the Purchase Order. The Security Deposit can be submitted in the form of Bank Guarantee or Fixed Deposit Receipt obtained from any Nationalized/ Scheduled Bank and it shall be kept valid for a period of sixty days beyond the date of completion of the Purchase Order. This Security Deposit will be returned to the Supplier only upon successful completion of all the contractual obligations or shall be adjusted/ forfeited against non-fulfilment of any of the contractual obligations. The Security Deposit shall be submitted within 30 days from the date of receipt of Purchase Order.	Yes / No / Explain	
16	Confirm: Conditions for BIDDER FROM A COUNTRY WHICH SHARES LAND BORDER WITH INDIA	Yes / No / Explain	
17	Liquidated Damages: The delivery period / completion period shall be the essence of the Purchase Order. If the Supplier fails to meet delivery date within the time specified above or any extension thereof, the Department will recover from the Supplier as Liquidated Damages (LD) a sum of 0.5% of the total order value for each calendar week of delay subject to a maximum of 10% of the total order value. Confirm your acceptance.	Yes / No / Explain	
18	Name of PRINCIPAL, Address, Contact No, E-mail Id etc. (specify):	Yes / No / Explain	
19	Name of Bidder, Address, Contact No. E-mail ID, etc., (specify)	Yes / No / Explain	
20	Currency quoted (specify)	Yes / No / Explain	
21	Warranty / Guarantee Period: (specify)	Yes / No / Explain	
22	Taxes and other costs, if any: (Specify).	Yes / No / Explain	

23	Performance Bank Guarantee: Performance Bank Guarantee (PBG) for 3% of the order value shall be submitted along with your Invoice/prior to final payment. It shall be valid till the warranty/ guarantee period and shall have an additional claim period of 60 days.	Yes / No / Explain	
24	Only Class-I and Class-II Local suppliers as per Make in India Policy are eligible to participate in the bid. Percentage of Local Content for the offered item / items shall be specified	Yes / No / Explain	
25	MSME preference is applicable only against the claim of the manufacturer and production of documentary evidence by the manufacturer for the registration of particular item under MSME.	Yes / No / Explain	
26	Bank Details (State Bank of India, Mahendragiri, Tirunelveli (Dist) - 627 133) Details of your bank shall be furnished.	Yes / No / Explain	
27	Percentage of Local Content	Yes / No / Explain	
28	Any other terms	Yes / No / Explain	

C.3 Price Bid

Sl. No.	Item	Quantity	Unit Price	Currency	Total Price	Remark
1	COMPRESSOR: Non-lubricated Hydrogen gas compressors	2.00 Nos.		-		
2	COMPRESSOR: Supervision charges per day person for erection & commissioning at SLHP, ASL, Saggonda	30.00 Days		-		

3	TRANSPORT ATION CHARGES: Up to SLHP, The Andhra Sugars Limited, Saggonda, Andhra Pradesh	1.00 Lot		-		
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