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

Tender for Supply of Manual Cryogenic Globe valves,Pneumatic actuated Cryogenic Globe valves & Cryogenic Globe control valve

Bids to be submitted online

Tender No.: IPRC/PURGP1/IP202400098401 dated 28-08-2024

A. Tender Details

Tender No :	**IPRC/PURGP1/IP202400098401**
Tender Date :	**28-08-2024**
Tender Classification:	**GOODS**
Purchase Entity :	**PURGP1**
Centre :	**ISRO PROPULSION COMPLEX (IPRC)**

Supply of Manual Cryogenic Globe valves,Pneumatic actuated Cryogenic Globe valves & Cryogenic Globe control valve

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

This is a TWO-PART tender i.e. Techno-Commercial Bid (Part-I) and Price Bid (Part-II) shall be submitted separately. All technical and commercial terms and conditions shall be furnished in the Techno Commercial Bid while price shall be indicated only in the Price Bid.

1.Foreign vendors are not permitted to quote.

2.Only Class-I and Class-II Local suppliers as per Make in India Policy are eligible to participate in the bid.

a. The percentage of local content with documentary should be specifically mentioned in the offer. Format for Self Certification under Preference to "MAKE IN INDIA" Policy ÃÂ¢ÃÂÃÂ attached, without which it will be summarily rejected.

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

3.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.

4.Items as per the tender are eligible for Concessional rate of GST@5% as per Notification No.07/2018-Integrated Tax (Rate) dated 25.01.2018 and Notification No.06/2018-Central Tax (Rate) dated 25.01.2018 along with Notification No. Ms No.18 dated 25.01.2018. Relevant Certificate shall be

issued after placement of P.O.

5.Last minute clarification on tenders will not be entertained.

6.This is an E Tender. Hence Postal/Fax/Email tenders will not be accepted.

7.Acceptance of Guarantee / Warranty, PBG, SD & L.D are mandatory. Bank Guarantee towards Security Deposit (S.D) shall be submitted, if the Purchase Order value exceeds Rs.5 Lakhs.

8. Security Deposit:

To ensure due execution of the Purchase Order, Vendor shall submit an interest free Security Deposit equivalent to 3% of the order value within 15 days from the date of receipt of Purchase Order. Security Deposit can be submitted by way of Bank Guarantee (as per format enclosed on Ã¢ÂÂ¹ 200/- stamp paper) from any Nationalized/ Scheduled Bank in favor of Accounts Officer, IPRC. The Bank Guarantee should be valid for 60 days beyond the scheduled delivery date. Security Deposit can be submitted by way of Fixed Deposit Receipt (lien marked to Accounts Officer, IPRC)/Demand Draft in favor of Accounts Officer, IPRC.

In case of BG, confirmation for issued BG may be sent by issuing Bank/Branch to Ã¢ÂÂ IFSC Code: SBIN0000880; SBI, Nagercoil Branch.

In case of non-execution of the Purchase Order within the stipulated delivery period, IPRC reserves the right to cancel the Purchase Order and forfeit the Security Deposit. However, based on request from the Vendor, in case IPRC agree to extend the delivery period with applicability of Liquidated Damages or otherwise, the validity of the Bank Guarantee should be suitably extended. It may be noted that adjustment of Security Deposit from the progressive payment/final bill is not permitted.

9. Performance Bank Guarantee:

In order to ensure due performance of warranty obligation, Vendor shall submit a Performance Bank Guarantee (PBG) equivalent to 3% of the order value. The PBG can be submitted by way of Bank Guarantee (as per format enclosed on Ã¢ÂÂ¹ 200/- stamp paper) from any Nationalized/Scheduled Bank in favor of Accounts Officer, IPRC. The Bank Guarantee should be valid for 60 days beyond the scheduled warranty period. In case the warranty period is extended due to any reasons, the validity of the Bank Guarantee shall also be extended suitably. PBG can be submitted by way of Fixed Deposit Receipt (lien marked to Accounts Officer, IPRC)/Demand Draft in favor of Accounts Officer, IPRC also. The PBG will be forfeited in case of non-performance of warranty obligation.

In case of BG, confirmation for issued BG may be sent by issuing Bank/Branch to Ã¢ÂÂ IFSC Code: SBIN0000880; SBI, Nagercoil Branch.

In case a Purchase Order requires submission of Security Deposit and Performance Bank Guarantee, Vendor has the option to submit a combined Bank Guarantee for Security Deposit and Performance Bank Guarantee within 15 days from the date of receipt of Purchase Order and valid for 60 days beyond completion of the warranty period/all contractual obligation. In case PBG is submitted by way FDR (lien marked to Accounts Officer, IPRC or Demand Draft (in favor of Accounts Officer, IPRC).

A.1 Tender Schedule

Bid Submission Start Date :	**28-08-2024 17:00**
Bid Clarification Due Date :	**06-09-2024 10:00**
Bid Submission Due Date :	**27-09-2024 10:00**
Bid Opening Date :	**27-09-2024 10:05**
Price Bid Opening Date :	**30-09-2024 10:05**

B. Tender Attachments

Technical Write-up/Drawings

Document : Special conditions

Instructions To Vendors

2. GENERAL TERMS AND CONDITIONS:

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) Local office in Tirunelveli / Nagercoil is preferable.
Note: (b) to (d) 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 NSIC, 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 (in the prescribed format) 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 period of two months beyond 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.

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 30 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 Technical bid opening & 90 days from the date of Price Bid opening (in case of two-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.

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

1. 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.

2. 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.

3. 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.

4. 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 there under 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.

5. 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.

6. Late Tenders will not be considered.

7. 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.

8. 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.

9. 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.

10. Quotation should be valid for at least 90 days from the date of opening of the tender.

11. Sales Tax and/or other duties/levies, where legally leviable and intended to be claimed, should be distinctly shown separately in the tender.

12. Specifications: Stores offered should strictly conform to Purchaser's 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.

13. 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.

14. 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.

15. 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 fulfillment of the Contract.

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

17. 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.

18. 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.

4. 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. 1 (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 maximum 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 if 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 2 (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 2 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 6 (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 3% 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 6 (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.

5. 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 ie., 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.

6. 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:
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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

C. Bid Templates

C.1 Technical Bid - Supply of Manual Cryogenic Globe valves,Pneumatic actuated Cryogenic Globe valves & Cryogenic Globe control valve

1. Manual Cryogenic Globe Valve: Supply of Manual Cryogenic Globe valves (UVM 1001,1003,1004, 1005,1012 & 1013) as per Technical specification & Special conditions attached in Annexure- 1 & 4 respectively

Item specifications for Manual Cryogenic Globe Valve

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	TECHNICAL SPECIFICATION OF MANUAL CRYOGENIC GLOBE VALVES	As per Annexure-1	Yes / No / Explain		
2	Valve Type	Manually Operated Extended Stem Cryogenic Bellow sealed Globe valves: MO-ESBSGV	Yes / No / Explain		
3	Tag number	As given in Table-1A	Yes / No / Explain		
4	Quantity	As given in Table-1A	Yes / No / Explain		
5	Pattern	Globe	Yes / No / Explain		
6	Actuation	By Hand wheel operation (manual)	Yes / No / Explain		
7	Configuration of ports/ways	As given in Table-1A	Yes / No / Explain		
8	Application	Shut-off/ isolation	Yes / No / Explain		
9	Fluid medium	As given in Table-1A	Yes / No / Explain		
10	Working temperature range	As given in Table-1A	Yes / No / Explain		
11	Nominal size (mm)	As given in Table-1A	Yes / No / Explain		
12	Maximum Allowable Working Pressure (MAWP)	As given in Table-1A	Yes / No / Explain		

13	Valve coefficient	To be specified by the bidder in the quotation	Yes / No / Explain		
14	Permissible leakage rate across body:	1E-7 Pa-m3/s (1E-6 mbar l/s.) of GHe	Yes / No / Explain		
15	Permissible Helium leakage rate across seat	1E-6 Pa-m3/s (1E-5 mbar l/s.)	Yes / No / Explain		
16	Guaranteed Cycles of operation	5,000 cycles	Yes / No / Explain		
17	End connection	BW: Butt welding ends as per ASME B 16.25 / 16.9. Pipe stubs as per ASME B 36.10 / 36.19 of 100 mm length each shall be butt-welded to the body on either side, the ends of which shall be prepared for butt welding. The butt welding ends shall be suitable to mate with the interfacing pipe size & schedule as per Table 1A.	Yes / No / Explain		
18	Style of construction: Body	With full port (standard bore) and in-line end connections	Yes / No / Explain		
19	Bonnet	Bolted or screwed to body with metal seals/ spring energized seals (such as Helicoflex, Enerseal, etc)/ any other suitable seals. The body bonnet joint shall be located on top of the stem extension such that the seal experiences near-ambient temperature. The stem extension shall be as per design code. The stem shall be of non rotating type.	Yes / No / Explain		
20	Stem	Non-rotating, rising stem.The stem operation for high pressure valves may be assisted by requisite bearing for easy operation of valve stem with/without load.	Yes / No / Explain		

21	Length of stem extension	As per BS 6364 or equivalent	Yes / No / Explain		
22	Stem (dynamic) seal	By bellows with redundant gland packing. Between the bellows seal and the redundant gland packing, a tell-tale indicator pressure gauge shall be provided.	Yes / No / Explain		
23	Plug	Renewable (replaceable) from stem	Yes / No / Explain		
24	Seat	Renewable from body with seat insert.(Alternatively Seat may be integral with body provided that it is harder than the plug insert)	Yes / No / Explain		
25	Shut off Mode	Bi-directional shut off	Yes / No / Explain		
26	Flow direction	Flow-to-open (Flow-under-plug) and all the valves shall have bi-directional shut-off.	Yes / No / Explain		
27	Material of construction:Body and bonnet	ASTM A 182 F 304/ 316/ 304L/ 316L/ 321 (or) ASTM A351 CF 3/3M /CF 8/8M	Yes / No / Explain		
28	Stem, plug, seat	ASTM A 479 304/316/ 304L/ 316L/ 321	Yes / No / Explain		
29	Bellows	Stainless steel 316L/ 316Ti/ 321/ Hastealloy C 276/ Inconel 600/ 625/Incoloy	Yes / No / Explain		
30	Gland packing	PTFE/ Glass-filled PTFE/ PEEK/PCTFE (Kel-F)	Yes / No / Explain		
31	Plug & Seat insert	PCTFE (Kel-F)/ Polycarbonate	Yes / No / Explain		
32	Pipe stub	Seamless pipe - ASTM A 312 TP 304L/316L	Yes / No / Explain		
33	Bolts	ASTM A 193 Gr B 8	Yes / No / Explain		
34	Nuts	ASTM A 194 Gr 8	Yes / No / Explain		

35	Anti-static feature	The valves shall be either inherently anti-static or provided with anti-static features.	Yes / No / Explain		
36	Design code	BS5352 / BS 6364/ API 6-D/ ASME B16.34 or equivalent	Yes / No / Explain		
37	Test code	BS6755 / BS5155/ API 598/API 607 ASME B 16.34 or equivalent	Yes / No / Explain		
38	Note:	1. The valves shall be either inherently anti-static or provided with anti-static features 2. Alternative materials, if chosen as per manufacturer's standards, for any of the above parts the same shall be subject to approval by the purchaser.	Yes / No / Explain		
39	Tests: a. Material test certificates	The material test certificates, detailing the physical and chemical properties, of the principal pressure–bearing parts shall be provided.	Yes / No / Explain		
40	b. Dimensional Inspection	All valves have to be subjected to dimensional inspection as per the approved drawings.	Yes / No / Explain		
41	c. Welding joint test (wherever applicable)	All butt welding joints in the valve (including the joints between the body and the pipe stubs) shall be subjected to dye-penetrant test and radiographic test with X-rays or gamma rays to 2% sensitivity as per Section IX, ASME. All the socket welding joints shall be subject to dye-penetrant test.	Yes / No / Explain		

42	d. Bellows cyclic life test	3 Sample bellows drawn from each batch of the same size and type shall be subjected to (destructive) cyclic life (proto-type) test as per BS 5352/relevant standards. If the manufacturer of the bellows has already performed such test, copy of the certificate may be produced.	Yes / No / Explain		
43	e. Pre-assembly hydraulic shell pressure test	The valve shell, prior to assembly with the bellows, in partially open position, shall be subjected to pressure test with Water (with suitable corrosion inhibitor) at 1.5 times the maximum rated working pressure of the particular pressure rating class of the valve.	Yes / No / Explain		
44	f. Pneumatic shell pressure test	The valve, upon final assembly including the bellows, in partially open position shall be subjected to pressure test with dry air or GN2 at 1.1 times the maximum rated working pressure of the particular pressure rating class.	Yes / No / Explain		
45	g. Pneumatic seat pressure test	The valve, in closed position, shall be subjected to pressure test at 1.1 times the maximum rated working pressure of the particular pressure rating class of the valve.	Yes / No / Explain		

46	h. MSLD shell leakage test	The valve in open position,the global leakage rate across body shall be measured with gaseous Helium Mass Spectrometer Leakage Detector (MSLD) to establish the permissible leakage rate values specified above by hood technique as per Article 10, Section V, ASME. The leakage test shall be performed by shrouding the entire outside surface of the valve with a plastic bag to hold gaseous Helium at a positive pressure and by evacuating and connecting the inlet/ outlet port to MSLD. Leakage test by detector probe or tracer probe technique is not acceptable.	Yes / No / Explain		
47	i. MSLD seat leakage test	The global leakage rate across seat shall be measured with gaseous Helium MSLD to establish the permissible leakage rate values specified above by hood technique as per Article 10, Section V, ASME. The leakage test shall be performed by pressurizing the inlet not less than 25% of Maximum rated working pressure of particular pressure rating class of the valve with gaseous Helium and by evacuating and connecting the outlet to MSLD. Leakage test by detector probe or tracer probe technique is not acceptable.	Yes / No / Explain		

48	j. Functional Test	Each valve has to be subjected to functional test for free operation of valves to the full stroke length.	Yes / No / Explain		
49	k. Ultrasonic test	100% ultrasonic test shall be conducted for the pipe stubs.	Yes / No / Explain		
50	l. Soundness test for castings (wherever applicable)	All the castings/Forgings/pipe/Machined pressure bearing components shall be subjected to soundness test with radiographic or ultrasonic technique for flaw detection.	Yes / No / Explain		
51	Cleanliness	All the interior flow surfaces of the valve shall be degreased and cleaned to Oxygen service standards as per CGA G-4.1 or MIL-C-52211 or ASTM G 93. The valves shall be dispatched with end connection sealed by suitable plastic plugs to avoid contamination during transportation.	Yes / No / Explain		
52	Marking	All the valves are assigned tag numbers for the sake of identification. The tag number for each valve, as indicated above, besides size, pressure rating class, material of construction, etc, shall be legibly and indelibly engraved on the body of the valves.	Yes / No / Explain		
53	List of Manual globe valves	As per Table 1A	Yes / No / Explain		
54	Quality Assurance Plan (QAP)	As per Table 1B	Yes / No / Explain		

Document : Annexure 1

2. Manual Cryogenic Globe Valve : Spares for Manual Cryogenic Globe valves (UVM 1001,1003,1004, 1005,1012 & 1013) as per Technical specification & Special conditions attached

in Annexure- 1& 4 respectively

3. Manual Cryogenic Globe Valve: Supply of Manual Cryogenic Globe valve (UTV 1001) as per Technical specification & Special conditions attached in Annexure-1 & 4 respectively

Item specifications for Manual Cryogenic Globe Valve

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	TECHNICAL SPECIFICATION OF MANUAL CRYOGENIC GLOBE VALVES	As per Annexure-1	Yes / No / Explain		
2	Valve Type	Manually Operated Extended Stem Cryogenic Bellow sealed Globe valves: MO-ESBSGV	Yes / No / Explain		
3	Tag number	As given in Table-1A	Yes / No / Explain		
4	Quantity	As given in Table-1A	Yes / No / Explain		
5	Pattern	Globe	Yes / No / Explain		
6	Actuation	By Hand wheel operation (manual)	Yes / No / Explain		
7	Configuration of ports/ways	As given in Table-1A	Yes / No / Explain		
8	Application	Shut-off/ isolation	Yes / No / Explain		
9	Fluid medium	As given in Table-1A	Yes / No / Explain		
10	Working temperature range	As given in Table-1A	Yes / No / Explain		
11	Nominal size (mm)	As given in Table-1A	Yes / No / Explain		
12	Maximum Allowable Working Pressure (MAWP)	As given in Table-1A	Yes / No / Explain		
13	Valve coefficient	To be specified by the bidder in the quotation	Yes / No / Explain		
14	Permissible leakage rate across body :	1E-7 Pa-m3/s (1E-6 mbar l/s.) of GHe	Yes / No / Explain		

15	Permissible Helium leakage rate across seat	1E-6 Pa-m3/s (1E-5 mbar l/s.)	Yes / No / Explain		
16	Guaranteed Cycles of operation	5,000 cycles	Yes / No / Explain		
17	End connection	BW: Butt welding ends as per ASME B 16.25 / 16.9. Pipe stubs as per ASME B 36.10 / 36.19 of 100 mm length each shall be butt-welded to the body on either side, the ends of which shall be prepared for butt welding. The butt welding ends shall be suitable to mate with the interfacing pipe size & schedule as per Table 1A.	Yes / No / Explain		
18	Style of construction: Body	With full port (standard bore) and in-line end connections	Yes / No / Explain		
19	Bonnet	Bolted or screwed to body with metal seals/ spring energized seals (such as Helicoflex, Enerseal, etc)/ any other suitable seals. The body bonnet joint shall be located on top of the stem extension such that the seal experiences near-ambient temperature. The stem extension shall be as per design code. The stem shall be of non rotating type.	Yes / No / Explain		
20	Stem	Non-rotating, rising stem.The stem operation for high pressure valves may be assisted by requisite bearing for easy operation of valve stem with/without load.	Yes / No / Explain		
21	Length of stem extension	As per BS 6364 or equivalent	Yes / No / Explain		

22	Stem (dynamic) seal	By bellows with redundant gland packing. Between the bellows seal and the redundant gland packing, a tell-tale indicator pressure gauge shall be provided.	Yes / No / Explain		
23	Plug	Renewable (replaceable) from stem	Yes / No / Explain		
24	Seat	Renewable from body with seat insert.(Alternatively Seat may be integral with body provided that it is harder than the plug insert)	Yes / No / Explain		
25	Shut off Mode	Bi-directional shut off	Yes / No / Explain		
26	Flow direction	Flow-to-open (Flow-under-plug) and all the valves shall have bi-directional shut-off.	Yes / No / Explain		
27	Material of construction:Body and bonnet	ASTM A 182 F 304/ 316/ 304L/ 316L/ 321 (or) ASTM A351 CF 3/3M /CF 8/8M	Yes / No / Explain		
28	Stem, plug, seat	ASTM A 479 304/316/ 304L/ 316L/ 321	Yes / No / Explain		
29	Bellows	Stainless steel 316L/ 316Ti/ 321/ Hastealloy C 276/ Inconel 600/ 625/Incoloy	Yes / No / Explain		
30	Gland packing	PTFE/ Glass-filled PTFE/ PEEK/PCTFE (Kel-F)	Yes / No / Explain		
31	Plug & Seat insert	PCTFE (Kel-F)/ Polycarbonate	Yes / No / Explain		
32	Pipe stub	Seamless pipe - ASTM A 312 TP 304L/316L	Yes / No / Explain		
33	Bolts	ASTM A 193 Gr B 8	Yes / No / Explain		
34	Nuts	ASTM A 194 Gr 8	Yes / No / Explain		
35	Anti static feature	The valves shall be either inherently anti-static or provided with anti-static features.	Yes / No / Explain		

36	Design code	BS5352 / BS 6364/ API 6-D/ ASME B16.34 or equivalent	Yes / No / Explain		
37	Test code	BS6755 / BS5155/ API 598/API 607 ASME B 16.34 or equivalent	Yes / No / Explain		
38	Note:	1. The valves shall be either inherently anti-static or provided with anti-static features 2. Alternative materials, if chosen as per manufacturer's standards, for any of the above parts the same shall be subject to approval by the purchaser.	Yes / No / Explain		
39	Tests: a. Material test certificates	The material test certificates, detailing the physical and chemical properties, of the principal pressure–bearing parts shall be provided.	Yes / No / Explain		
40	b. Dimensional Inspection	All valves have to be subjected to dimensional inspection as per the approved drawings.	Yes / No / Explain		
41	c. Welding joint test (wherever applicable)	All butt welding joints in the valve (including the joints between the body and the pipe stubs) shall be subjected to dye-penetrant test and radiographic test with X-rays or gamma rays to 2% sensitivity as per Section IX, ASME. All the socket welding joints shall be subject to dye-penetrant test.	Yes / No / Explain		

42	d. Bellows cyclic life test	3 Sample bellows drawn from each batch of the same size and type shall be subjected to (destructive) cyclic life (proto-type) test as per BS 5352/relevant standards. If the manufacturer of the bellows has already performed such test, copy of the certificate may be produced.	Yes / No / Explain		
43	e. Pre-assembly hydraulic shell pressure test	The valve shell, prior to assembly with the bellows, in partially open position, shall be subjected to pressure test with Water (with suitable corrosion inhibitor) at 1.5 times the maximum rated working pressure of the particular pressure rating class of the valve.	Yes / No / Explain		
44	f. Pneumatic shell pressure test	The valve, upon final assembly including the bellows, in partially open position shall be subjected to pressure test with dry air or GN2 at 1.1 times the maximum rated working pressure of the particular pressure rating class.	Yes / No / Explain		
45	g. Pneumatic seat pressure test	The valve, in closed position, shall be subjected to pressure test at 1.1 times the maximum rated working pressure of the particular pressure rating class of the valve.	Yes / No / Explain		

46	h. MSLD shell leakage test	The valve in open position, the global leakage rate across body shall be measured with gaseous Helium Mass Spectrometer Leakage Detector (MSLD) to establish the permissible leakage rate values specified above by hood technique as per Article 10, Section V, ASME. The leakage test shall be performed by shrouding the entire outside surface of the valve with a plastic bag to hold gaseous Helium at a positive pressure and by evacuating and connecting the inlet/ outlet port to MSLD. Leakage test by detector probe or tracer probe technique is not acceptable.	Yes / No / Explain		
47	i. MSLD seat leakage test	The global leakage rate across seat shall be measured with gaseous Helium MSLD to establish the permissible leakage rate values specified above by hood technique as per Article 10, Section V, ASME. The leakage test shall be performed by pressurizing the inlet not less than 25% of Maximum rated working pressure of particular pressure rating class of the valve with gaseous Helium and by evacuating and connecting the outlet to MSLD. Leakage test by detector probe or tracer probe technique is not acceptable.	Yes / No / Explain		

48	j. Functional Test	Each valve has to be subjected to functional test for free operation of valves to the full stroke length.	Yes / No / Explain		
49	k. Ultrasonic test	100% ultrasonic test shall be conducted for the pipe stubs.	Yes / No / Explain		
50	l. Soundness test for castings (wherever applicable)	All the castings/Forgings/pipe/Machined pressure bearing components shall be subjected to soundness test with radiographic or ultrasonic technique for flaw detection.	Yes / No / Explain		
51	Cleanliness	All the interior flow surfaces of the valve shall be degreased and cleaned to Oxygen service standards as per CGA G-4.1 or MIL-C-52211 or ASTM G 93. The valves shall be dispatched with end connection sealed by suitable plastic plugs to avoid contamination during transportation.	Yes / No / Explain		
52	Marking	All the valves are assigned tag numbers for the sake of identification. The tag number for each valve, as indicated above, besides size, pressure rating class, material of construction, etc, shall be legibly and indelibly engraved on the body of the valves.	Yes / No / Explain		
53	List of Manual globe valves	As per Table 1A	Yes / No / Explain		
54	Quality Assurance Plan (QAP)	As per Table 1B	Yes / No / Explain		

Document : Annexure 1

4. Manual Cryogenic Globe Valve : Spares for Manual Cryogenic Globe valve (UTV 1001) as per Technical specification & Special conditions attached in Annexure- 1 & 4 respectively

5. Pneumatically Actuated Cryogenic Globe Valve: Supply of Pneumatically actuated Cryogenic Globe valves (UVP 1004 & 1005) as per Technical specification & Special conditions attached in Annexure- 2 & 4 respectively

Item specifications for Pneumatically Actuated Cryogenic Globe Valve

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	TECHNICAL SPECIFICATION OF PNEUMATICALLY-ACTUATED CRYOGENIC GLOBE VALVES	As per Annexure-2	Yes / No / Explain		
2	Valve : Type	Pneumatically-Actuated Extended stem Bellow sealed Cryogenic globe valve (PA-ESBSGV)	Yes / No / Explain		
3	Tag number	As per Table 2A	Yes / No / Explain		
4	Quantity	As per Table 2A	Yes / No / Explain		
5	Pattern	Globe	Yes / No / Explain		
6	Application	Shut-off/ isolation/ on-off	Yes / No / Explain		
7	Actuation	Pneumatic actuator	Yes / No / Explain		
8	Normal position	As per Table 2A	Yes / No / Explain		
9	Fluid medium	As per Table 2A	Yes / No / Explain		
10	Working temperature range	As per Table 2A	Yes / No / Explain		
11	Nominal size (mm)	As per Table 2A	Yes / No / Explain		
12	Maximum Allowable Working Pressure (MAWP)	As per Table 2A	Yes / No / Explain		
13	Valve coefficient	To be specified by the bidder in the quotation	Yes / No / Explain		
14	Permissible leakage rate across body	1E-7 Pa-m3/s (1E-6 mbar l/s.) of GHe	Yes / No / Explain		

15	Permissible leakage rate across Seat	1E-6 Pa-m3/s (1E-5 mbar l/s.)	Yes / No / Explain		
16	Guaranteed Cycle of operation	5000	Yes / No / Explain		
17	End connection	BW: Butt welding ends as per ASME B 16.9/ 16.25. Pipe stubs as per ASME B 36.19/ 36.10 of 100 mm length each shall be butt-welded to the body on either side, the ends of which shall be prepared for butt welding. The butt welding ends shall be suitable to mate with the interfacing pipe & schedule as per Table 2A.	Yes / No / Explain		
18	Style of construction: Body	With full port (standard bore) and in-line end connections	Yes / No / Explain		
19	Bonnet	Bolted or screwed to body with metal seals/ spring energized seals (such as Helicoflex, Enerseal, etc)/ any other suitable seals. The body bonnet joint shall be located on top of the stem extension such that the seal experiences near-ambient temperature. The stem extension shall be as per design code. The stem shall be of non rotating type.	Yes / No / Explain		
20	Stem	Non-rotating, rising stem.	Yes / No / Explain		
21	Stem (dynamic) seal	By bellows with redundant gland packing. Between the bellows seal and the redundant gland packing, a tell-tale indicator pressure gauge shall be provided.	Yes / No / Explain		
22	Stem extension length (For ESBSG Valves)	As per BS 6364 or equivalent	Yes / No / Explain		

23	Plug	Renewable (replaceable) from stem	Yes / No / Explain		
24	Seat	Renewable from body with seat insert.(Alternatively Seat may be integral with body provided that it is harder than the plug insert)	Yes / No / Explain		
25	Shut off mode	Bi-directional shut off	Yes / No / Explain		
26	Flow direction	Flow-to-open (Flow-under-plug) and all the valves shall have Bi-directional shut-off.	Yes / No / Explain		
27	Material of Construction: Body and bonnet	ASTM A 182 F 304/304L/ 316/316L/ 321 For ≤DN40 , ASTM A 351 CF 3/ 3M For ≥ DN50	Yes / No / Explain		
28	Stem, plug, seat	ASTM A 479 304/316/304L/ 316L/ 321	Yes / No / Explain		
29	Bellows	Stainless steel 316L/ 316Ti/ 321/ Hastealloy C 276/ Inconel 600/ 625/Incoloy	Yes / No / Explain		
30	Gland packing	PTFE/ Glass-filled PTFE/ PEEK/PCTFE (Kel-F)	Yes / No / Explain		
31	Plug & seat insert	PCTFE(Kel-F)/ Polycarbonate	Yes / No / Explain		
32	Pipe stub	Seamless pipe-ASTM A 312 TP 304L/316L	Yes / No / Explain		
33	Bolts	ASTM A 193 B 8	Yes / No / Explain		
34	Nuts	ASTM A 194 Gr 8	Yes / No / Explain		
35	Design code	BS5352 / BS 6364/ API 6-D/ ASME B16.34 or equivalent	Yes / No / Explain		
36	Test code	BS6755 / BS5155/ API 598/API 607 ASME B 16.34 or equivalent	Yes / No / Explain		

37	Note	1. The valves shall be either inherently anti-static or provided with anti-static features. 2. Alternative materials, if chosen as per manufacturer's standards, for any of the above parts the same shall be subject to approval by the purchaser.	Yes / No / Explain		
38	PNEUMATIC ACTUATOR: Type	Linear actuator, piston/ diaphragm type, single acting, spring return, fail-safe	Yes / No / Explain		
39	PNEUMATIC ACTUATOR: Normal position	As per Table 2A	Yes / No / Explain		
40	Command gas	Gaseous Nitrogen at 0.6 to 0.7 MPa(g) (Wherever the command gas is less than 0.55 MPa (g) suitable filter regulator shall be installed for each valve. The actuator & Air filter Regulator shall be suitably connected with tubings.)	Yes / No / Explain		
41	Failure position	Close- Normally closed valves Open- Normally open valves	Yes / No / Explain		
42	Response time (for both opening and closing strokes)	As per Table 2A If required, flow (volume) booster, necessary tubings and quick exhaust valve shall be incorporated to achieve the specified response time.	Yes / No / Explain		
43	End connection for command gas	Suitable NPT (F) to ASME B 1.10.1.	Yes / No / Explain		
44	Material	Carbon steel (enamel-painted)	Yes / No / Explain		
45	Test (along with valve assembly)	The response time taken for opening and closing of the valve shall be evaluated.	Yes / No / Explain		

46	STATUS SWITCHES	The valve shall be provided with a pair of non-contact type proximity status switches to indicate the “Open/Close” status of the valve. The status switches shall be mounted on the valve with such proper arrangement that does not require any adjustment/ alignment for the specified cycles of operation of the valve.	Yes / No / Explain		
47	Type	Cylindrical Inductive Type Proximity Sensor (switch) in accordance with NAMUR	Yes / No / Explain		
48	Sensing Distance	The sensing distance shall be suitably selected by the valve manufacturer according to the valve stroke length.	Yes / No / Explain		
49	Electrical Configuration	DC, 2 wire	Yes / No / Explain		
50	Nominal Voltage	8 V	Yes / No / Explain		
51	Operating Voltage	5 – 24 V	Yes / No / Explain		
52	Switching Frequency	0 to 500 HZ	Yes / No / Explain		
53	Reverse Polarity	Shall be Protected against reverse polarity	Yes / No / Explain		
54	Short-Circuit protection	Shall be Protected for short circuit	Yes / No / Explain		
55	Current Consumption:Not Sensing	≥ 3 mA	Yes / No / Explain		
56	Sensing	≤ 1 mA	Yes / No / Explain		
57	Indication of switching state	LED	Yes / No / Explain		
58	Connection Type	2 metre long PVC Cable	Yes / No / Explain		

59	Ambient Temperature	- 25 degree Celsius to 80degree Celsius	Yes / No / Explain		
60	Housing Material	Stainless Steel	Yes / No / Explain		
61	Protection Degree	IP 67	Yes / No / Explain		
62	Safety Aspects	Shall be intrinsically safe for Hydrogen (IIC) ambience	Yes / No / Explain		
63	Hazardous area Certification	The switches shall be intrinsically safe for Hydrogen environment in conformance with Ex ia IIC T6,Zone 1 of IEC/ATEX.The certificate of conformance to this effect from the accredited agency shall be provided.	Yes / No / Explain		
64	Note: Certificate matrix	Copy of Certificate matrix (including Make & Model) of the status switch shall be provided to the Department prior to procurement of status switches for its approval. Suggested Make: a. PEPPERL & FUCHS - Germany b. OMRON – USA c. Rockwell Automation – USA d. LongVale Ltd – UK e. Euroswitch - UK f. Cario Gavazzi g. IFM electronic	Yes / No / Explain		
65	Tests: a. Material test certificates	The material test certificates, detailing the physical and chemical properties, of the principal pressure–bearing parts shall be provided.	Yes / No / Explain		
66	b. Dimensional Inspection	All valves have to be subjected to dimensional inspection as per the approved drawings.	Yes / No / Explain		

67	c. Welding joint test (wherever applicable)	All butt welding joints in the valve (including the joints between the body and the pipe stubs) shall be subjected to dye-penetrant test and radiographic test with X-rays or gamma rays to 2% sensitivity as per Section IX, ASME. All the butt welding joints & socket welding joints shall be subject to dye-penetrant test.	Yes / No / Explain		
68	d. Bellows Cyclic life test	3 Sample bellows drawn from each batch of the same size and type shall be subject to (destructive) cyclic life (proto-type) test as per BS 5352/ relevant standards. If the Manufacturer of the bellows has already performed such test, copy of the certificate may be produced.	Yes / No / Explain		
69	e. Ultrasonic test	100% ultrasonic test shall be conducted for the pipe stubs.	Yes / No / Explain		
70	f. Soundness test for castings (wherever applicable)	All the castings shall be subject to soundness test with radiographic or ultrasonic technique for flaw detection.	Yes / No / Explain		
71	g. Pre-assembly hydraulic shell pressure test	The valve shell, prior to assembly with the bellows, in partially open position, shall be subjected to pressure test with Water (with suitable corrosion inhibitor) at 1.5 times the maximum rated working pressure of the particular pressure rating class of the valve.	Yes / No / Explain		

72	h. Pneumatic shell pressure test	The valve, upon final assembly including the bellows, in partially open position shall be subjected to pressure test with dry air or GN2 at 1.1 times the maximum rated working pressure of the particular pressure rating class.	Yes / No / Explain		
73	i. Pneumatic seat pressure test	The valve, in closed position, shall be subjected to pressure test at 1.1 times the maximum rated working pressure of the particular pressure rating class of the valve.	Yes / No / Explain		
74	j. MSLD shell leakage test	The valve in open position,the global leakage rate across body shall be measured with gaseous Helium Mass Spectrometer Leakage Detector (MSLD) to establish the permissible leakage rate values specified above by hood technique as per Article 10, Section V, ASME. The leakage test shall be performed by shrouding the entire outside surface of the valve with a plastic bag to hold gaseous Helium at a positive pressure and by evacuating and connecting the inlet/ outlet port to MSLD. Leakage test by detector probe or tracer probe technique is not acceptable.	Yes / No / Explain		

75	k. MSLD seat leakage test	The global leakage rate across seat shall be measured with gaseous Helium MSLD to establish the permissible leakage rate values specified above by hood technique as per Article 10, Section V, ASME. The leakage test shall be performed by pressurizing the inlet not less than 25% of Maximum rated working pressure of the particular pressure rating class of the valve with gaseous Helium and by evacuating and connecting the outlet to MSLD. Leakage test by detector probe or tracer probe technique is not acceptable.	Yes / No / Explain		
76	l. Functional Test	Each valve has to be subjected to functional test for verification of free operation of valves to the full stroke length.The response time taken for full opening and closing of the valve shall be evaluated.	Yes / No / Explain		
77	Cleanliness	All the interior flow surfaces of the valve shall be degreased and cleaned to Oxygen service standards as per CGA G-4.1 or MIL-C-52211 or ASTM G 93. The valves shall be dispatched with end connection sealed by suitable plastic plugs to avoid contamination during transportation.	Yes / No / Explain		

78	Marking	All the valves are assigned tag numbers for the sake of identification. The tag number for each valve, as indicated above, besides size, pressure rating class, material of construction, etc, shall be legibly and indelibly engraved on the body of the valves and its response time.	Yes / No / Explain		
79	List of Pneumatic Actuated Globe Valves	As per Table 2A	Yes / No / Explain		
80	Quality Assurance Plan (QAP)	As per Table 2B	Yes / No / Explain		

Document : Annexure 2

6. Pneumatically Actuated Cryogenic Globe Valve: Spares for Pneumatically actuated Cryogenic Globe valves (UVP 1004 & 1005) as per Technical specification & Special conditions attached in Annexure- 2 & 4 respectively

7. Pneumatically Actuated Cryogenic Globe Valve: Supply of Pneumatically actuated Cryogenic Globe valves (UVP 1001,1003,1006,1007,1008,1010 & 1014) as per Technical specification & Special conditions attached in Annexure-2 & 4 respectively

Item specifications for Pneumatically Actuated Cryogenic Globe Valve

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	TECHNICAL SPECIFICATION OF PNEUMATICALLY-ACTUATED CRYOGENIC GLOBE VALVES	As per Annexure-2	Yes / No / Explain		
2	Valve : Type	Pneumatically-Actuated Extended stem Bellow sealed Cryogenic globe valve (PA-ESBSGV)	Yes / No / Explain		
3	Tag number	As per Table 2A	Yes / No / Explain		
4	Quantity	As per Table 2A	Yes / No / Explain		

5	Pattern	Globe	Yes / No / Explain		
6	Application	Shut-off/ isolation/ on-off	Yes / No / Explain		
7	Actuation	Pneumatic actuator	Yes / No / Explain		
8	Normal position	As per Table 2A	Yes / No / Explain		
9	Fluid medium	As per Table 2A	Yes / No / Explain		
10	Working temperature range	As per Table 2A	Yes / No / Explain		
11	Nominal size (mm)	As per Table 2A	Yes / No / Explain		
12	Maximum Allowable Working Pressure (MAWP)	As per Table 2A	Yes / No / Explain		
13	Valve coefficient	To be specified by the bidder in the quotation	Yes / No / Explain		
14	Permissible leakage rate across body	1E-7 Pa-m3/s (1E-6 mbar l/s.) of GHe	Yes / No / Explain		
15	Permissible leakage rate across Seat	1E-6 Pa-m3/s (1E-5 mbar l/s.)	Yes / No / Explain		
16	Guaranteed Cycle of operation	5000	Yes / No / Explain		
17	End connection	BW: Butt welding ends as per ASME B 16.9/ 16.25. Pipe stubs as per ASME B 36.19/ 36.10 of 100 mm length each shall be butt-welded to the body on either side, the ends of which shall be prepared for butt welding. The butt welding ends shall be suitable to mate with the interfacing pipe & schedule as per Table 2A.	Yes / No / Explain		
18	Style of construction: Body	With full port (standard bore) and in-line end connections	Yes / No / Explain		

19	Bonnet	Bolted or screwed to body with metal seals/ spring energized seals (such as Helicoflex, Enerseal, etc)/ any other suitable seals. The body bonnet joint shall be located on top of the stem extension such that the seal experiences near-ambient temperature. The stem extension shall be as per design code. The stem shall be of non rotating type.	Yes / No / Explain		
20	Stem	Non-rotating, rising stem.	Yes / No / Explain		
21	Stem (dynamic) seal	By bellows with redundant gland packing. Between the bellows seal and the redundant gland packing, a tell-tale indicator pressure gauge shall be provided.	Yes / No / Explain		
22	Stem extension length (For ESBSG Valves)	As per BS 6364 or equivalent	Yes / No / Explain		
23	Plug	Renewable (replaceable) from stem	Yes / No / Explain		
24	Seat	Renewable from body with seat insert.(Alternatively Seat may be integral with body provided that it is harder than the plug insert)	Yes / No / Explain		
25	Shut off mode	Bi-directional shut off	Yes / No / Explain		
26	Flow direction	Flow-to-open (Flow-under-plug) and all the valves shall have Bi-directional shut-off.	Yes / No / Explain		
27	Material of construction: Body and bonnet	ASTM A 182 F 304/304L/ 316/316L/ 321 For ≤DN40 , ASTM A 351 CF 3/ 3M For ≥ DN50	Yes / No / Explain		
28	Stem, plug, seat	ASTM A 479 304/316/304L/ 316L/ 321	Yes / No / Explain		

29	Bellows	Stainless steel 316L/ 316Ti/ 321/ Hastealloy C 276/ Inconel 600/ 625/Incoloy	Yes / No / Explain		
30	Gland packing	PTFE/ Glass-filled PTFE/ PEEK/PCTFE (Kel-F)	Yes / No / Explain		
31	Plug & seat insert	PCTFE(Kel-F)/ Polycarbonate	Yes / No / Explain		
32	Pipe stub	Seamless pipe- ASTM A 312 TP 304L/316L	Yes / No / Explain		
33	Bolts	ASTM A 193 B 8	Yes / No / Explain		
34	Nuts	ASTM A 194 Gr 8	Yes / No / Explain		
35	Design code	BS5352 / BS 6364/ API 6-D/ ASME B16.34 or equivalent	Yes / No / Explain		
36	Test code	BS6755 / BS5155/ API 598/API 607 ASME B 16.34 or equivalent	Yes / No / Explain		
37	Note:	1. The valves shall be either inherently anti-static or provided with anti-static features. 2. Alternative materials, if chosen as per manufacturer's standards, for any of the above parts the same shall be subject to approval by the purchaser.	Yes / No / Explain		
38	PNEUMATIC ACTUATOR: Type	Linear actuator, piston/ diaphragm type, single acting, spring return, fail-safe	Yes / No / Explain		
39	PNEUMATIC ACTUATOR: Normal position	As per Table 2A	Yes / No / Explain		

40	Command gas	Gaseous Nitrogen at 0.6 to 0.7 MPa(g) (Wherever the command gas is less than 0.55 MPa (g) suitable filter regulator shall be installed for each valve. The actuator & Air filter Regulator shall be suitably connected with tubings.)	Yes / No / Explain		
41	Failure position	Close- Normally closed valves Open- Normally open valves	Yes / No / Explain		
42	Response time (for both opening and closing strokes)	As per Table 2A If required, flow (volume) booster, necessary tubings and quick exhaust valve shall be incorporated to achieve the specified response time.	Yes / No / Explain		
43	End connection for command gas	Suitable NPT (F) to ASME B 1.10.1.	Yes / No / Explain		
44	Material	Carbon steel (enamel-painted)	Yes / No / Explain		
45	Test (along with valve assembly)	The response time taken for opening and closing of the valve shall be evaluated.	Yes / No / Explain		
46	STATUS SWITCHES	The valve shall be provided with a pair of non-contact type proximity status switches to indicate the “Open/Close” status of the valve. The status switches shall be mounted on the valve with such proper arrangement that does not require any adjustment/ alignment for the specified cycles of operation of the valve.	Yes / No / Explain		
47	Type	Cylindrical Inductive Type Proximity Sensor (switch) in accordance with NAMUR	Yes / No / Explain		

48	Sensing Distance	The sensing distance shall be suitably selected by the valve manufacturer according to the valve stroke length.	Yes / No / Explain		
49	Electrical Configuration	DC, 2 wire	Yes / No / Explain		
50	Nominal Voltage	8 V	Yes / No / Explain		
51	Operating Voltage	5 – 24 V	Yes / No / Explain		
52	Switching Frequency	0 to 500 HZ	Yes / No / Explain		
53	Reverse Polarity	Shall be Protected against reverse polarity	Yes / No / Explain		
54	Short-Circuit protection	Shall be Protected for short circuit	Yes / No / Explain		
55	Current Consumption:Not Sensing	≥ 3 mA	Yes / No / Explain		
56	Current Consumption:Sensing	≤ 1 mA	Yes / No / Explain		
57	Indication of switching state	LED	Yes / No / Explain		
58	Connection Type	2 metre long PVC Cable	Yes / No / Explain		
59	Ambient Temperature	- 25 degree Celsius to 80 degree Celsius	Yes / No / Explain		
60	Housing Material	Stainless Steel	Yes / No / Explain		
61	Protection Degree	IP 67	Yes / No / Explain		
62	Safety Aspects	Shall be intrinsically safe for Hydrogen (IIC) ambience	Yes / No / Explain		
63	Hazardous area Certification	The switches shall be intrinsically safe for Hydrogen environment in conformance with Ex ia IIC T6,Zone 1 of IEC/ATEX.The certificate of conformance to this effect from the accredited agency shall be provided.	Yes / No / Explain		

64	Note:Certificate matrix	Copy of Certificate matrix (including Make & Model) of the status switch shall be provided to the Department prior to procurement of status switches for its approval. Suggested Make: a. PEPPERL & FUCHS - Germany b. OMRON – USA c. Rockwell Automation – USA d. LongVale Ltd – UK e. Euroswitch - UK f. Cario Gavazzi g. IFM electronic	Yes / No / Explain		
65	Tests: a. Material test certificates	The material test certificates, detailing the physical and chemical properties, of the principal pressure–bearing parts shall be provided.	Yes / No / Explain		
66	b. Dimensional Inspection	All valves have to be subjected to dimensional inspection as per the approved drawings.	Yes / No / Explain		
67	c. Welding joint test (wherever applicable)	All butt welding joints in the valve (including the joints between the body and the pipe stubs) shall be subjected to dye-penetrant test and radiographic test with X-rays or gamma rays to 2% sensitivity as per Section IX, ASME. All the butt welding joints & socket welding joints shall be subject to dye-penetrant test.	Yes / No / Explain		

68	d. Bellows Cyclic life test	3 Sample bellows drawn from each batch of the same size and type shall be subject to (destructive) cyclic life (proto-type) test as per BS 5352/ relevant standards. If the Manufacturer of the bellows has already performed such test, copy of the certificate may be produced.	Yes / No / Explain		
69	e. Ultrasonic test	100% ultrasonic test shall be conducted for the pipe stubs.	Yes / No / Explain		
70	f. Soundness test for castings (wherever applicable)	All the castings shall be subject to soundness test with radiographic or ultrasonic technique for flaw detection.	Yes / No / Explain		
71	g. Pre-assembly hydraulic shell pressure test	The valve shell, prior to assembly with the bellows, in partially open position, shall be subjected to pressure test with Water (with suitable corrosion inhibitor) at 1.5 times the maximum rated working pressure of the particular pressure rating class of the valve.	Yes / No / Explain		
72	h. Pneumatic shell pressure test	The valve, upon final assembly including the bellows, in partially open position shall be subjected to pressure test with dry air or GN2 at 1.1 times the maximum rated working pressure of the particular pressure rating class.	Yes / No / Explain		
73	i. Pneumatic seat pressure test	The valve, in closed position, shall be subjected to pressure test at 1.1 times the maximum rated working pressure of the particular pressure rating class of the valve.	Yes / No / Explain		

74	j. MSLD shell leakage test	The valve in open position, the global leakage rate across body shall be measured with gaseous Helium Mass Spectrometer Leakage Detector (MSLD) to establish the permissible leakage rate values specified above by hood technique as per Article 10, Section V, ASME. The leakage test shall be performed by shrouding the entire outside surface of the valve with a plastic bag to hold gaseous Helium at a positive pressure and by evacuating and connecting the inlet/ outlet port to MSLD. Leakage test by detector probe or tracer probe technique is not acceptable.	Yes / No / Explain		
75	k. MSLD seat leakage test	The global leakage rate across seat shall be measured with gaseous Helium MSLD to establish the permissible leakage rate values specified above by hood technique as per Article 10, Section V, ASME. The leakage test shall be performed by pressurizing the inlet not less than 25% of Maximum rated working pressure of the particular pressure rating class of the valve with gaseous Helium and by evacuating and connecting the outlet to MSLD. Leakage test by detector probe or tracer probe technique is not acceptable.	Yes / No / Explain		

76	I. Functional Test	Each valve has to be subjected to functional test for verification of free operation of valves to the full stroke length.The response time taken for full opening and closing of the valve shall be evaluated.	Yes / No / Explain		
77	Cleanliness	All the interior flow surfaces of the valve shall be degreased and cleaned to Oxygen service standards as per CGA G-4.1 or MIL-C-52211 or ASTM G 93. The valves shall be dispatched with end connection sealed by suitable plastic plugs to avoid contamination during transportation.	Yes / No / Explain		
78	Marking	All the valves are assigned tag numbers for the sake of identification. The tag number for each valve, as indicated above, besides size, pressure rating class, material of construction, etc, shall be legibly and indelibly engraved on the body of the valves and its response time.	Yes / No / Explain		
79	List of Pneumatic Actuated Globe Valves	As per Table 2A	Yes / No / Explain		
80	Quality Assurance Plan (QAP)	As per Table 2B	Yes / No / Explain		

Document : Annexure 2

8. Pneumatically Actuated Cryogenic Globe Valve: Spares for Pneumatically actuated Cryogenic Globe valves (UVP 1001,1003,1006,1007,1008,1010 & 1014) as per Technical specification & Special conditions attached in Annexure-2 & 4 respectively

9. Pneumatically Actuated Cryogenic Globe Valve: Supply of Pneumatically actuated Cryogenic Globe valve (UVP 1011) as per Technical specification & Special conditions attached in

Annexure-2 & 4 respectively

Item specifications for Pneumatically Actuated Cryogenic Globe Valve

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	TECHNICAL SPECIFICATION OF PNEUMATICALLY-ACTUATED CRYOGENIC GLOBE VALVES	As per Annexure-2	Yes / No / Explain		
2	Valve : Type	Pneumatically-Actuated Extended stem Bellow sealed Cryogenic globe valve (PA-ESBSGV)	Yes / No / Explain		
3	Tag number	As per Table 2A	Yes / No / Explain		
4	Quantity	As per Table 2A	Yes / No / Explain		
5	Pattern	Globe	Yes / No / Explain		
6	Application	Shut-off/ isolation/ on-off	Yes / No / Explain		
7	Actuation	Pneumatic actuator	Yes / No / Explain		
8	Normal position	As per Table 2A	Yes / No / Explain		
9	Fluid medium	As per Table 2A	Yes / No / Explain		
10	Working temperature range	As per Table 2A	Yes / No / Explain		
11	Nominal size (mm)	As per Table 2A	Yes / No / Explain		
12	Maximum Allowable Working Pressure (MAWP)	As per Table 2A	Yes / No / Explain		
13	Valve coefficient	To be specified by the bidder in the quotation	Yes / No / Explain		
14	Permissible leakage rate across body	1E-7 Pa-m3/s (1E-6 mbar l/s.) of GHe	Yes / No / Explain		
15	Permissible leakage rate across Seat	1E-6 Pa-m3/s (1E-5 mbar l/s.)	Yes / No / Explain		

16	Guaranteed Cycle of operation	5000	Yes / No / Explain		
17	End connection	BW: Butt welding ends as per ASME B 16.9/ 16.25. Pipe stubs as per ASME B 36.19/ 36.10 of 100 mm length each shall be butt-welded to the body on either side, the ends of which shall be prepared for butt welding. The butt welding ends shall be suitable to mate with the interfacing pipe & schedule as per Table 2A.	Yes / No / Explain		
18	Style of construction: Body	With full port (standard bore) and in-line end connections	Yes / No / Explain		
19	Bonnet	Bolted or screwed to body with metal seals/ spring energized seals (such as Helicoflex, Enerseal, etc)/ any other suitable seals. The body bonnet joint shall be located on top of the stem extension such that the seal experiences near-ambient temperature. The stem extension shall be as per design code. The stem shall be of non rotating type.	Yes / No / Explain		
20	Stem	Non-rotating, rising stem.	Yes / No / Explain		
21	Stem (dynamic) seal	By bellows with redundant gland packing. Between the bellows seal and the redundant gland packing, a tell-tale indicator pressure gauge shall be provided.	Yes / No / Explain		
22	Stem extension length (For ESBSG Valves)	As per BS 6364 or equivalent	Yes / No / Explain		
23	Plug	Renewable (replaceable) from stem	Yes / No / Explain		

24	Seat	Renewable from body with seat insert.(Alternatively Seat may be integral with body provided that it is harder than the plug insert)	Yes / No / Explain		
25	Shut off mode	Bi-directional shut off	Yes / No / Explain		
26	Flow direction	Flow-to-open (Flow-under-plug) and all the valves shall have Bi-directional shut-off.	Yes / No / Explain		
27	Material of construction: Body and bonnet	ASTM A 182 F 304/304L/ 316/316L/ 321 For ≤DN40 , ASTM A 351 CF 3/ 3M For ≥ DN50	Yes / No / Explain		
28	Stem, plug, seat	ASTM A 479 304/316/304L/ 316L/ 321	Yes / No / Explain		
29	Bellows	Stainless steel 316L/ 316Ti/ 321/ Hastealloy C 276/ Inconel 600/ 625/Incoloy	Yes / No / Explain		
30	Gland packing	PTFE/ Glass-filled PTFE/ PEEK/PCTFE (Kel-F)	Yes / No / Explain		
31	Plug & seat insert	PCTFE(Kel-F)/ Polycarbonate	Yes / No / Explain		
32	Pipe stub	Seamless pipe-ASTM A 312 TP 304L/316L	Yes / No / Explain		
33	Bolts	ASTM A 193 B 8	Yes / No / Explain		
34	Nuts	ASTM A 194 Gr 8	Yes / No / Explain		
35	Design code	BS5352 / BS 6364/ API 6-D/ ASME B16.34 or equivalent	Yes / No / Explain		
36	Test code	BS6755 / BS5155/ API 598/API 607 ASME B 16.34 or equivalent	Yes / No / Explain		

37	Note:	1. The valves shall be either inherently anti-static or provided with anti-static features. 2. Alternative materials, if chosen as per manufacturer's standards, for any of the above parts the same shall be subject to approval by the purchaser.	Yes / No / Explain		
38	PNEUMATIC ACTUATOR: Type	Linear actuator, piston/ diaphragm type, single acting, spring return, fail-safe	Yes / No / Explain		
39	PNEUMATIC ACTUATOR: Normal position	As per Table 2A	Yes / No / Explain		
40	Command gas	Gaseous Nitrogen at 0.6 to 0.7 MPa(g) (Wherever the command gas is less than 0.55 MPa (g) suitable filter regulator shall be installed for each valve. The actuator & Air filter Regulator shall be suitably connected with tubings.)	Yes / No / Explain		
41	Failure position	Close- Normally closed valves Open- Normally open valves	Yes / No / Explain		
42	Response time (for both opening and closing strokes)	As per Table 2A If required, flow (volume) booster, necessary tubings and quick exhaust valve shall be incorporated to achieve the specified response time.	Yes / No / Explain		
43	End connection for command gas	Suitable NPT (F) to ASME B 1.10.1.	Yes / No / Explain		
44	Material	Carbon steel (enamel-painted)	Yes / No / Explain		
45	Test (along with valve assembly)	The response time taken for opening and closing of the valve shall be evaluated.	Yes / No / Explain		

46	STATUS SWITCHES	The valve shall be provided with a pair of non-contact type proximity status switches to indicate the “Open/Close” status of the valve. The status switches shall be mounted on the valve with such proper arrangement that does not require any adjustment/ alignment for the specified cycles of operation of the valve.	Yes / No / Explain		
47	Type	Cylindrical Inductive Type Proximity Sensor (switch) in accordance with NAMUR	Yes / No / Explain		
48	Sensing Distance	The sensing distance shall be suitably selected by the valve manufacturer according to the valve stroke length.	Yes / No / Explain		
49	Electrical Configuration	DC, 2 wire	Yes / No / Explain		
50	Nominal Voltage	8 V	Yes / No / Explain		
51	Operating Voltage	5 – 24 V	Yes / No / Explain		
52	Switching Frequency	0 to 500 HZ	Yes / No / Explain		
53	Reverse Polarity	Shall be Protected against reverse polarity	Yes / No / Explain		
54	Short-Circuit protection	Shall be Protected for short circuit	Yes / No / Explain		
55	Current Consumption:Not Sensing	≥ 3 mA	Yes / No / Explain		
56	Current Consumption:Sensing	≤ 1 mA	Yes / No / Explain		
57	Indication of switching state	LED	Yes / No / Explain		
58	Connection Type	2 metre long PVC Cable	Yes / No / Explain		

59	Ambient Temperature	- 25 degree Celsius to 80 degree Celsius	Yes / No / Explain		
60	Housing Material	Stainless Steel	Yes / No / Explain		
61	Protection Degree	IP 67	Yes / No / Explain		
62	Safety Aspects	Shall be intrinsically safe for Hydrogen (IIC) ambience	Yes / No / Explain		
63	Hazardous area Certification	The switches shall be intrinsically safe for Hydrogen environment in conformance with Ex ia IIC T6,Zone 1 of IEC/ATEX.The certificate of conformance to this effect from the accredited agency shall be provided.	Yes / No / Explain		
64	Note: Certificate matrix	Copy of Certificate matrix (including Make & Model) of the status switch shall be provided to the Department prior to procurement of status switches for its approval. Suggested Make: a. PEPPERL & FUCHS - Germany b. OMRON – USA c. Rockwell Automation – USA d. LongVale Ltd – UK e. Euroswitch - UK f. Cario Gavazzi g. IFM electronic	Yes / No / Explain		
65	Tests: a. Material test certificates	The material test certificates, detailing the physical and chemical properties, of the principal pressure–bearing parts shall be provided.	Yes / No / Explain		
66	b. Dimensional Inspection	All valves have to be subjected to dimensional inspection as per the approved drawings.	Yes / No / Explain		

67	c. Welding joint test (wherever applicable)	All butt welding joints in the valve (including the joints between the body and the pipe stubs) shall be subjected to dye-penetrant test and radiographic test with X-rays or gamma rays to 2% sensitivity as per Section IX, ASME. All the butt welding joints & socket welding joints shall be subject to dye-penetrant test.	Yes / No / Explain		
68	d. Bellows Cyclic life test	3 Sample bellows drawn from each batch of the same size and type shall be subject to (destructive) cyclic life (proto-type) test as per BS 5352/ relevant standards. If the Manufacturer of the bellows has already performed such test, copy of the certificate may be produced.	Yes / No / Explain		
69	e. Ultrasonic test	100% ultrasonic test shall be conducted for the pipe stubs.	Yes / No / Explain		
70	f. Soundness test for castings (wherever applicable)	All the castings shall be subject to soundness test with radiographic or ultrasonic technique for flaw detection.	Yes / No / Explain		
71	g. Pre-assembly hydraulic shell pressure test	The valve shell, prior to assembly with the bellows, in partially open position, shall be subjected to pressure test with Water (with suitable corrosion inhibitor) at 1.5 times the maximum rated working pressure of the particular pressure rating class of the valve.	Yes / No / Explain		

72	h. Pneumatic shell pressure test	The valve, upon final assembly including the bellows, in partially open position shall be subjected to pressure test with dry air or GN2 at 1.1 times the maximum rated working pressure of the particular pressure rating class.	Yes / No / Explain		
73	i. Pneumatic seat pressure test	The valve, in closed position, shall be subjected to pressure test at 1.1 times the maximum rated working pressure of the particular pressure rating class of the valve.	Yes / No / Explain		
74	j. MSLD shell leakage test	Th valve in open position, the global leakage rate across body shall be measured with gaseous Helium Mass Spectrometer Leakage Detector (MSLD) to establish the permissible leakage rate values specified above by hood technique as per Article 10, Section V, ASME. The leakage test shall be performed by shrouding the entire outside surface of the valve with a plastic bag to hold gaseous Helium at a positive pressure and by evacuating and connecting the inlet/ outlet port to MSLD. Leakage test by detector probe or tracer probe technique is not acceptable.	Yes / No / Explain		

75	k. MSLD seat leakage test	The global leakage rate across seat shall be measured with gaseous Helium MSLD to establish the permissible leakage rate values specified above by hood technique as per Article 10, Section V, ASME. The leakage test shall be performed by pressurizing the inlet not less than 25% of Maximum rated working pressure of the particular pressure rating class of the valve with gaseous Helium and by evacuating and connecting the outlet to MSLD. Leakage test by detector probe or tracer probe technique is not acceptable.	Yes / No / Explain		
76	l. Functional Test	Each valve has to be subjected to functional test for verification of free operation of valves to the full stroke length.The response time taken for full opening and closing of the valve shall be evaluated.	Yes / No / Explain		
77	Cleanliness	All the interior flow surfaces of the valve shall be degreased and cleaned to Oxygen service standards as per CGA G-4.1 or MIL-C-52211 or ASTM G 93. The valves shall be dispatched with end connection sealed by suitable plastic plugs to avoid contamination during transportation.	Yes / No / Explain		

78	Marking	All the valves are assigned tag numbers for the sake of identification. The tag number for each valve, as indicated above, besides size, pressure rating class, material of construction, etc, shall be legibly and indelibly engraved on the body of the valves and its response time.	Yes / No / Explain		
79	List of Pneumatic Actuated Globe Valves	As per Table 2A	Yes / No / Explain		
80	Quality Assurance Plan (QAP)	As per Table 2B	Yes / No / Explain		

Document : Annexure 2

10. Pneumatically Actuated Cryogenic Globe Valve: Spares for Pneumatically actuated Cryogenic Globe valve (UVP 1011) as per Technical specification & Special conditions attached in Annexure-2 & 4 respectively

11. Pneumatically Actuated Cryogenic Globe Valve: Supply of Pneumatically actuated Cryogenic Globe valve (UVP 1009) as per Technical specification & Special conditions attached in Annexure-2 & 4 respectively

Item specifications for Pneumatically Actuated Cryogenic Globe Valve

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	TECHNICAL SPECIFICATION OF PNEUMATICALLY-ACTUATED CRYOGENIC GLOBE VALVES	As per Annexure-2	Yes / No / Explain		
2	Valve : Type	Pneumatically-Actuated Extended stem Bellow sealed Cryogenic globe valve (PA-ESBSGV)	Yes / No / Explain		
3	Tag number	As per Table 2A	Yes / No / Explain		
4	Quantity	As per Table 2A	Yes / No / Explain		

5	Pattern	Globe	Yes / No / Explain		
6	Application	Shut-off/ isolation/ on-off	Yes / No / Explain		
7	Actuation	Pneumatic actuator	Yes / No / Explain		
8	Normal position	As per Table 2A	Yes / No / Explain		
9	Fluid medium	As per Table 2A	Yes / No / Explain		
10	Working temperature range	As per Table 2A	Yes / No / Explain		
11	Nominal size (mm)	As per Table 2A	Yes / No / Explain		
12	Maximum Allowable Working Pressure (MAWP)	As per Table 2A	Yes / No / Explain		
13	Valve coefficient	To be specified by the bidder in the quotation	Yes / No / Explain		
14	Permissible leakage rate across body	1E-7 Pa-m3/s (1E-6 mbar l/s.) of GHe	Yes / No / Explain		
15	Permissible leakage rate across Seat	1E-6 Pa-m3/s (1E-5 mbar l/s.)	Yes / No / Explain		
16	Guaranteed Cycle of operation	5000	Yes / No / Explain		
17	End connection	BW: Butt welding ends as per ASME B 16.9/ 16.25. Pipe stubs as per ASME B 36.19/ 36.10 of 100 mm length each shall be butt-welded to the body on either side, the ends of which shall be prepared for butt welding. The butt welding ends shall be suitable to mate with the interfacing pipe & schedule as per Table 2A.	Yes / No / Explain		
18	Style of construction: Body	With full port (standard bore) and in-line end connections	Yes / No / Explain		

19	Bonnet	Bolted or screwed to body with metal seals/ spring energized seals (such as Helicoflex, Enerseal, etc)/ any other suitable seals. The body bonnet joint shall be located on top of the stem extension such that the seal experiences near-ambient temperature. The stem extension shall be as per design code. The stem shall be of non rotating type.	Yes / No / Explain		
20	Stem	Non-rotating, rising stem.	Yes / No / Explain		
21	Stem (dynamic) seal	By bellows with redundant gland packing. Between the bellows seal and the redundant gland packing, a tell-tale indicator pressure gauge shall be provided.	Yes / No / Explain		
22	Stem extension length (For ESBSG Valves)	As per BS 6364 or equivalent	Yes / No / Explain		
23	Plug	Renewable (replaceable) from stem	Yes / No / Explain		
24	Seat	Renewable from body with seat insert.(Alternatively Seat may be integral with body provided that it is harder than the plug insert)	Yes / No / Explain		
25	Shut off mode	Bi-directional shut off	Yes / No / Explain		
26	Flow direction	Flow-to-open (Flow-under-plug) and all the valves shall have Bi-directional shut-off.	Yes / No / Explain		
27	Material of construction: Body and bonnet	ASTM A 182 F 304/304L/ 316/316L/ 321 For ≤DN40 , ASTM A 351 CF 3/ 3M For ≥ DN50	Yes / No / Explain		
28	Stem, plug, seat	ASTM A 479 304/316/304L/ 316L/ 321	Yes / No / Explain		

29	Bellows	Stainless steel 316L/ 316Ti/ 321/ Hastealloy C 276/ Inconel 600/ 625/Incoloy	Yes / No / Explain		
30	Gland packing	PTFE/ Glass-filled PTFE/ PEEK/PCTFE (Kel-F)	Yes / No / Explain		
31	Plug & seat insert	PCTFE(Kel-F)/ Polycarbonate	Yes / No / Explain		
32	Pipe stub	Seamless pipe- ASTM A 312 TP 304L/316L	Yes / No / Explain		
33	Bolts	ASTM A 193 B 8	Yes / No / Explain		
34	Nuts	ASTM A 194 Gr 8	Yes / No / Explain		
35	Design code	BS5352 / BS 6364/ API 6-D/ ASME B16.34 or equivalent	Yes / No / Explain		
36	Test code	BS6755 / BS5155/ API 598/API 607 ASME B 16.34 or equivalent	Yes / No / Explain		
37	Note:	1. The valves shall be either inherently anti-static or provided with anti-static features. 2. Alternative materials, if chosen as per manufacturer's standards, for any of the above parts the same shall be subject to approval by the purchaser.	Yes / No / Explain		
38	PNEUMATIC ACTUATOR: Type	Linear actuator, piston/ diaphragm type, single acting, spring return, fail-safe	Yes / No / Explain		
39	PNEUMATIC ACTUATOR: Normal position	As per Table 2A	Yes / No / Explain		

40	Command gas	Gaseous Nitrogen at 0.6 to 0.7 MPa(g) (Wherever the command gas is less than 0.55 MPa (g) suitable filter regulator shall be installed for each valve. The actuator & Air filter Regulator shall be suitably connected with tubings.)	Yes / No / Explain		
41	Failure position	Close- Normally closed valves Open- Normally open valves	Yes / No / Explain		
42	Response time (for both opening and closing strokes)	As per Table 2A If required, flow (volume) booster, necessary tubings and quick exhaust valve shall be incorporated to achieve the specified response time.	Yes / No / Explain		
43	End connection for command gas	Suitable NPT (F) to ASME B 1.10.1.	Yes / No / Explain		
44	Material	Carbon steel (enamel-painted)	Yes / No / Explain		
45	Test (along with valve assembly)	The response time taken for opening and closing of the valve shall be evaluated.	Yes / No / Explain		
46	STATUS SWITCHES	The valve shall be provided with a pair of non-contact type proximity status switches to indicate the “Open/Close” status of the valve. The status switches shall be mounted on the valve with such proper arrangement that does not require any adjustment/ alignment for the specified cycles of operation of the valve.	Yes / No / Explain		
47	Type	Cylindrical Inductive Type Proximity Sensor (switch) in accordance with NAMUR	Yes / No / Explain		

48	Sensing Distance	The sensing distance shall be suitably selected by the valve manufacturer according to the valve stroke length.	Yes / No / Explain		
49	Electrical Configuration	DC, 2 wire	Yes / No / Explain		
50	Nominal Voltage	8 V	Yes / No / Explain		
51	Operating Voltage	5 – 24 V	Yes / No / Explain		
52	Switching Frequency	0 to 500 HZ	Yes / No / Explain		
53	Reverse Polarity	Shall be Protected against reverse polarity	Yes / No / Explain		
54	Short-Circuit protection	Shall be Protected for short circuit	Yes / No / Explain		
55	Current Consumption:Not Sensing	≥ 3 mA	Yes / No / Explain		
56	Current Consumption:Sensing	≤ 1 mA	Yes / No / Explain		
57	Indication of switching state	LED	Yes / No / Explain		
58	Connection Type	2 metre long PVC Cable	Yes / No / Explain		
59	Ambient Temperature	- 25 degree Celsius to 80 degree Celsius	Yes / No / Explain		
60	Housing Material	Stainless Steel	Yes / No / Explain		
61	Protection Degree	IP 67	Yes / No / Explain		
62	Safety Aspects	Shall be intrinsically safe for Hydrogen (IIC) ambience	Yes / No / Explain		
63	Hazardous area Certification	The switches shall be intrinsically safe for Hydrogen environment in conformance with Ex ia IIC T6,Zone 1 of IEC/ATEX.The certificate of conformance to this effect from the accredited agency shall be provided.	Yes / No / Explain		

64	Note:Certificate matrix	Copy of Certificate matrix (including Make & Model) of the status switch shall be provided to the Department prior to procurement of status switches for its approval. Suggested Make: a. PEPPERL & FUCHS - Germany b. OMRON – USA c. Rockwell Automation – USA d. LongVale Ltd – UK e. Euroswitch - UK f. Cario Gavazzi g. IFM electronic	Yes / No / Explain		
65	Tests: a. Material test certificates	The material test certificates, detailing the physical and chemical properties, of the principal pressure–bearing parts shall be provided.	Yes / No / Explain		
66	b. Dimensional Inspection	All valves have to be subjected to dimensional inspection as per the approved drawings.	Yes / No / Explain		
67	c. Welding joint test (wherever applicable)	All butt welding joints in the valve (including the joints between the body and the pipe stubs) shall be subjected to dye-penetrant test and radiographic test with X-rays or gamma rays to 2% sensitivity as per Section IX, ASME. All the butt welding joints & socket welding joints shall be subject to dye-penetrant test.	Yes / No / Explain		

68	d. Bellows Cyclic life test	3 Sample bellows drawn from each batch of the same size and type shall be subject to (destructive) cyclic life (proto-type) test as per BS 5352/ relevant standards. If the Manufacturer of the bellows has already performed such test, copy of the certificate may be produced.	Yes / No / Explain		
69	e. Ultrasonic test	100% ultrasonic test shall be conducted for the pipe stubs.	Yes / No / Explain		
70	f. Soundness test for castings (wherever applicable)	All the castings shall be subject to soundness test with radiographic or ultrasonic technique for flaw detection.	Yes / No / Explain		
71	g. Pre-assembly hydraulic shell pressure test	The valve shell, prior to assembly with the bellows, in partially open position, shall be subjected to pressure test with Water (with suitable corrosion inhibitor) at 1.5 times the maximum rated working pressure of the particular pressure rating class of the valve.	Yes / No / Explain		
72	h. Pneumatic shell pressure test	The valve, upon final assembly including the bellows, in partially open position shall be subjected to pressure test with dry air or GN2 at 1.1 times the maximum rated working pressure of the particular pressure rating class.	Yes / No / Explain		
73	i. Pneumatic seat pressure test	The valve, in closed position, shall be subjected to pressure test at 1.1 times the maximum rated working pressure of the particular pressure rating class of the valve.	Yes / No / Explain		

74	j. MSLD shell leakage test	The valve in open position,the global leakage rate across body shall be measured with gaseous Helium Mass Spectrometer Leakage Detector (MSLD) to establish the permissible leakage rate values specified above by hood technique as per Article 10, Section V, ASME. The leakage test shall be performed by shrouding the entire outside surface of the valve with a plastic bag to hold gaseous Helium at a positive pressure and by evacuating and connecting the inlet/ outlet port to MSLD. Leakage test by detector probe or tracer probe technique is not acceptable.	Yes / No / Explain		
75	k. MSLD seat leakage test	The global leakage rate across seat shall be measured with gaseous Helium MSLD to establish the permissible leakage rate values specified above by hood technique as per Article 10, Section V, ASME. The leakage test shall be performed by pressurizing the inlet not less than 25% of Maximum rated working pressure of the particular pressure rating class of the valve with gaseous Helium and by evacuating and connecting the outlet to MSLD. Leakage test by detector probe or tracer probe technique is not acceptable.	Yes / No / Explain		

76	I. Functional Test	Each valve has to be subjected to functional test for verification of free operation of valves to the full stroke length.The response time taken for full opening and closing of the valve shall be evaluated.	Yes / No / Explain		
77	Cleanliness	All the interior flow surfaces of the valve shall be degreased and cleaned to Oxygen service standards as per CGA G-4.1 or MIL-C-52211 or ASTM G 93. The valves shall be dispatched with end connection sealed by suitable plastic plugs to avoid contamination during transportation.	Yes / No / Explain		
78	Marking	All the valves are assigned tag numbers for the sake of identification. The tag number for each valve, as indicated above, besides size, pressure rating class, material of construction, etc, shall be legibly and indelibly engraved on the body of the valves and its response time.	Yes / No / Explain		
79	List of Pneumatic Actuated Globe Valves	As per Table 2A	Yes / No / Explain		
80	Quality Assurance Plan (QAP)	As per Table 2B	Yes / No / Explain		

Document : Annexure 2

12. Pneumatically Actuated Cryogenic Globe Valve: Spares for Pneumatically actuated Cryogenic Globe valve (UVP 1009) as per Technical specification & Special conditions attached in Annexure-2 & 4 respectively

13. Pneumatically Actuated Cryogenic Globe Valve: Supply of Pneumatically actuated Cryogenic Globe valve (UVP 1012) as per Technical specification & Special conditions attached

in Annexure-2 & 4 respectively

Item specifications for Pneumatically Actuated Cryogenic Globe Valve

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	TECHNICAL SPECIFICATION OF PNEUMATICALLY-ACTUATED CRYOGENIC GLOBE VALVES	As per Annexure- 2	Yes / No / Explain		
2	Valve : Type	Pneumatically-Actuated Extended stem Bellow sealed Cryogenic globe valve (PA-ESBSGV)	Yes / No / Explain		
3	Tag number	As per Table 2A	Yes / No / Explain		
4	Quantity	As per Table 2A	Yes / No / Explain		
5	Pattern	Globe	Yes / No / Explain		
6	Application	Shut-off/ isolation/ on-off	Yes / No / Explain		
7	Actuation	Pneumatic actuator	Yes / No / Explain		
8	Normal position	As per Table 2A	Yes / No / Explain		
9	Fluid medium	As per Table 2A	Yes / No / Explain		
10	Working temperature range	As per Table 2A	Yes / No / Explain		
11	Nominal size (mm)	As per Table 2A	Yes / No / Explain		
12	Maximum Allowable Working Pressure (MAWP)	As per Table 2A	Yes / No / Explain		
13	Valve coefficient	To be specified by the bidder in the quotation	Yes / No / Explain		
14	Permissible leakage rate across body	1E-7 Pa-m3/s (1E-6 mbar l/s.) of GHe	Yes / No / Explain		
15	Permissible leakage rate across Seat	1E-6 Pa-m3/s (1E-5 mbar l/s.)	Yes / No / Explain		

16	Guaranteed Cycle of operation	5000	Yes / No / Explain		
17	End connection	BW: Butt welding ends as per ASME B 16.9/ 16.25. Pipe stubs as per ASME B 36.19/ 36.10 of 100 mm length each shall be butt-welded to the body on either side, the ends of which shall be prepared for butt welding. The butt welding ends shall be suitable to mate with the interfacing pipe & schedule as per Table 2A.	Yes / No / Explain		
18	Style of construction: Body	With full port (standard bore) and in-line end connections	Yes / No / Explain		
19	Bonnet	Bolted or screwed to body with metal seals/ spring energized seals (such as Helicoflex, Enerseal, etc)/ any other suitable seals. The body bonnet joint shall be located on top of the stem extension such that the seal experiences near-ambient temperature. The stem extension shall be as per design code. The stem shall be of non rotating type.	Yes / No / Explain		
20	Stem	Non-rotating, rising stem.	Yes / No / Explain		
21	Stem (dynamic) seal	By bellows with redundant gland packing. Between the bellows seal and the redundant gland packing, a tell-tale indicator pressure gauge shall be provided.	Yes / No / Explain		
22	Stem extension length (For ESBSG Valves)	As per BS 6364 or equivalent	Yes / No / Explain		
23	Plug	Renewable (replaceable) from stem	Yes / No / Explain		

24	Seat	Renewable from body with seat insert.(Alternatively Seat may be integral with body provided that it is harder than the plug insert)	Yes / No / Explain		
25	Shut off mode	Bi-directional shut off	Yes / No / Explain		
26	Flow direction	Flow-to-open (Flow-under-plug) and all the valves shall have Bi-directional shut-off.	Yes / No / Explain		
27	Material of construction: Body and bonnet	ASTM A 182 F 304/304L/ 316/316L/ 321 For ≤DN40 , ASTM A 351 CF 3/ 3M For ≥ DN50	Yes / No / Explain		
28	Stem, plug, seat	ASTM A 479 304/316/304L/ 316L/ 321	Yes / No / Explain		
29	Bellows	Stainless steel 316L/ 316Ti/ 321/ Hastealloy C 276/ Inconel 600/ 625/Incoloy	Yes / No / Explain		
30	Gland packing	PTFE/ Glass-filled PTFE/ PEEK/PCTFE (Kel-F)	Yes / No / Explain		
31	Plug & seat insert	PCTFE(Kel-F)/ Polycarbonate	Yes / No / Explain		
32	Pipe stub	Seamless pipe-ASTM A 312 TP 304L/316L	Yes / No / Explain		
33	Bolts	ASTM A 193 B 8	Yes / No / Explain		
34	Nuts	ASTM A 194 Gr 8	Yes / No / Explain		
35	Design code	BS5352 / BS 6364/ API 6-D/ ASME B16.34 or equivalent	Yes / No / Explain		
36	Test code	BS6755 / BS5155/ API 598/API 607 ASME B 16.34 or equivalent	Yes / No / Explain		

37	Note:	1. The valves shall be either inherently anti-static or provided with anti-static features. 2. Alternative materials, if chosen as per manufacturer's standards, for any of the above parts the same shall be subject to approval by the purchaser.	Yes / No / Explain		
38	PNEUMATIC ACTUATOR: Type	Linear actuator, piston/ diaphragm type, single acting, spring return, fail-safe	Yes / No / Explain		
39	PNEUMATIC ACTUATOR: Normal position	As per Table 2A	Yes / No / Explain		
40	Command gas	Gaseous Nitrogen at 0.6 to 0.7 MPa(g) (Wherever the command gas is less than 0.55 MPa (g) suitable filter regulator shall be installed for each valve. The actuator & Air filter Regulator shall be suitably connected with tubings.)	Yes / No / Explain		
41	Failure position	Close- Normally closed valves Open- Normally open valves	Yes / No / Explain		
42	Response time (for both opening and closing strokes)	As per Table 2A If required, flow (volume) booster, necessary tubings and quick exhaust valve shall be incorporated to achieve the specified response time.	Yes / No / Explain		
43	End connection for command gas	Suitable NPT (F) to ASME B 1.10.1.	Yes / No / Explain		
44	Material	Carbon steel (enamel-painted)	Yes / No / Explain		
45	Test (along with valve assembly)	The response time taken for opening and closing of the valve shall be evaluated.	Yes / No / Explain		

46	STATUS SWITCHES	The valve shall be provided with a pair of non-contact type proximity status switches to indicate the “Open/Close” status of the valve. The status switches shall be mounted on the valve with such proper arrangement that does not require any adjustment/ alignment for the specified cycles of operation of the valve.	Yes / No / Explain		
47	Type	Cylindrical Inductive Type Proximity Sensor (switch) in accordance with NAMUR	Yes / No / Explain		
48	Sensing Distance	The sensing distance shall be suitably selected by the valve manufacturer according to the valve stroke length.	Yes / No / Explain		
49	Electrical Configuration	DC, 2 wire	Yes / No / Explain		
50	Nominal Voltage	8 V	Yes / No / Explain		
51	Operating Voltage	5 – 24 V	Yes / No / Explain		
52	Switching Frequency	0 to 500 HZ	Yes / No / Explain		
53	Reverse Polarity	Shall be Protected against reverse polarity	Yes / No / Explain		
54	Short-Circuit protection	Shall be Protected for short circuit	Yes / No / Explain		
55	Current Consumption: Not Sensing	≥ 3 mA	Yes / No / Explain		
56	Current Consumption:Sensing	≤ 1 mA	Yes / No / Explain		
57	Indication of switching state	LED	Yes / No / Explain		
58	Connection Type	2 metre long PVC Cable	Yes / No / Explain		

59	Ambient Temperature	- 25 degree Celsius to 80 degree Celsius	Yes / No / Explain		
60	Housing Material	Stainless Steel	Yes / No / Explain		
61	Protection Degree	IP 67	Yes / No / Explain		
62	Safety Aspects	Shall be intrinsically safe for Hydrogen (IIC) ambience	Yes / No / Explain		
63	Hazardous area Certification	The switches shall be intrinsically safe for Hydrogen environment in conformance with Ex ia IIC T6,Zone 1 of IEC/ATEX.The certificate of conformance to this effect from the accredited agency shall be provided.	Yes / No / Explain		
64	Note: Certificate matrix	Copy of Certificate matrix (including Make & Model) of the status switch shall be provided to the Department prior to procurement of status switches for its approval. Suggested Make: a. PEPPERL & FUCHS - Germany b. OMRON – USA c. Rockwell Automation – USA d. LongVale Ltd – UK e. Euroswitch - UK f. Cario Gavazzi g. IFM electronic	Yes / No / Explain		
65	Tests: a. Material test certificates	The material test certificates, detailing the physical and chemical properties, of the principal pressure–bearing parts shall be provided.	Yes / No / Explain		
66	b. Dimensional Inspection	All valves have to be subjected to dimensional inspection as per the approved drawings.	Yes / No / Explain		

67	c. Welding joint test (wherever applicable)	All butt welding joints in the valve (including the joints between the body and the pipe stubs) shall be subjected to dye-penetrant test and radiographic test with X-rays or gamma rays to 2% sensitivity as per Section IX, ASME. All the butt welding joints & socket welding joints shall be subject to dye-penetrant test.	Yes / No / Explain		
68	d. Bellows Cyclic life test	3 Sample bellows drawn from each batch of the same size and type shall be subject to (destructive) cyclic life (proto-type) test as per BS 5352/ relevant standards. If the Manufacturer of the bellows has already performed such test, copy of the certificate may be produced.	Yes / No / Explain		
69	e. Ultrasonic test	100% ultrasonic test shall be conducted for the pipe stubs.	Yes / No / Explain		
70	f. Soundness test for castings (wherever applicable)	All the castings shall be subject to soundness test with radiographic or ultrasonic technique for flaw detection.	Yes / No / Explain		
71	g. Pre-assembly hydraulic shell pressure test	The valve shell, prior to assembly with the bellows, in partially open position, shall be subjected to pressure test with Water (with suitable corrosion inhibitor) at 1.5 times the maximum rated working pressure of the particular pressure rating class of the valve.	Yes / No / Explain		

72	h. Pneumatic shell pressure test	The valve, upon final assembly including the bellows, in partially open position shall be subjected to pressure test with dry air or GN2 at 1.1 times the maximum rated working pressure of the particular pressure rating class.	Yes / No / Explain		
73	i. Pneumatic seat pressure test	The valve, in closed position, shall be subjected to pressure test at 1.1 times the maximum rated working pressure of the particular pressure rating class of the valve.	Yes / No / Explain		
74	j. MSLD shell leakage test	The valve in open position,the global leakage rate across body shall be measured with gaseous Helium Mass Spectrometer Leakage Detector (MSLD) to establish the permissible leakage rate values specified above by hood technique as per Article 10, Section V, ASME. The leakage test shall be performed by shrouding the entire outside surface of the valve with a plastic bag to hold gaseous Helium at a positive pressure and by evacuating and connecting the inlet/ outlet port to MSLD. Leakage test by detector probe or tracer probe technique is not acceptable.	Yes / No / Explain		

75	k. MSLD seat leakage test	The global leakage rate across seat shall be measured with gaseous Helium MSLD to establish the permissible leakage rate values specified above by hood technique as per Article 10, Section V, ASME. The leakage test shall be performed by pressurizing the inlet not less than 25% of Maximum rated working pressure of the particular pressure rating class of the valve with gaseous Helium and by evacuating and connecting the outlet to MSLD. Leakage test by detector probe or tracer probe technique is not acceptable.	Yes / No / Explain		
76	l. Functional Test	Each valve has to be subjected to functional test for verification of free operation of valves to the full stroke length.The response time taken for full opening and closing of the valve shall be evaluated.	Yes / No / Explain		
77	Cleanliness	All the interior flow surfaces of the valve shall be degreased and cleaned to Oxygen service standards as per CGA G-4.1 or MIL-C-52211 or ASTM G 93. The valves shall be dispatched with end connection sealed by suitable plastic plugs to avoid contamination during transportation.	Yes / No / Explain		

78	Marking	All the valves are assigned tag numbers for the sake of identification. The tag number for each valve, as indicated above, besides size, pressure rating class, material of construction, etc, shall be legibly and indelibly engraved on the body of the valves and its response time.	Yes / No / Explain		
79	List of Pneumatic Actuated Globe Valves	As per Table 2A	Yes / No / Explain		
80	Quality Assurance Plan (QAP)	As per Table 2B	Yes / No / Explain		

Document : Annexure 2

14. Pneumatically Actuated Cryogenic Globe Valve: Spares for Pneumatically actuated Cryogenic Globe valve (UVP 1012) as per Technical specification & Special conditions attached in Annexure-2 & 4 respectively

15. Pneumatically Actuated Cryogenic Globe Valve: Supply of Pneumatically actuated Cryogenic Globe valves (UVP 1002 & 1016) as per Technical specification & Special conditions attached in Annexure-2 & 4 respectively

Item specifications for Pneumatically Actuated Cryogenic Globe Valve

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	TECHNICAL SPECIFICATION OF PNEUMATICALLY-ACTUATED CRYOGENIC GLOBE VALVES	As per Annexure-2	Yes / No / Explain		
2	Valve : Type	Pneumatically-Actuated Extended stem Bellow sealed Cryogenic globe valve (PA-ESBSGV)	Yes / No / Explain		
3	Tag number	As per Table 2A	Yes / No / Explain		
4	Quantity	As per Table 2A	Yes / No / Explain		

5	Pattern	Globe	Yes / No / Explain		
6	Application	Shut-off/ isolation/ on-off	Yes / No / Explain		
7	Actuation	Pneumatic actuator	Yes / No / Explain		
8	Normal position	As per Table 2A	Yes / No / Explain		
9	Fluid medium	As per Table 2A	Yes / No / Explain		
10	Working temperature range	As per Table 2A	Yes / No / Explain		
11	Nominal size (mm)	As per Table 2A	Yes / No / Explain		
12	Maximum Allowable Working Pressure (MAWP)	As per Table 2A	Yes / No / Explain		
13	Valve coefficient	To be specified by the bidder in the quotation	Yes / No / Explain		
14	Permissible leakage rate across body	1E-7 Pa-m3/s (1E-6 mbar l/s.) of GHe	Yes / No / Explain		
15	Permissible leakage rate across Seat	1E-6 Pa-m3/s (1E-5 mbar l/s.)	Yes / No / Explain		
16	Guaranteed Cycle of operation	5000	Yes / No / Explain		
17	End connection	BW: Butt welding ends as per ASME B 16.9/ 16.25. Pipe stubs as per ASME B 36.19/ 36.10 of 100 mm length each shall be butt-welded to the body on either side, the ends of which shall be prepared for butt welding. The butt welding ends shall be suitable to mate with the interfacing pipe & schedule as per Table 2A.	Yes / No / Explain		
18	Style of construction: Body	With full port (standard bore) and in-line end connections	Yes / No / Explain		

19	Bonnet	Bolted or screwed to body with metal seals/ spring energized seals (such as Helicoflex, Enerseal, etc)/ any other suitable seals. The body bonnet joint shall be located on top of the stem extension such that the seal experiences near-ambient temperature. The stem extension shall be as per design code. The stem shall be of non rotating type.	Yes / No / Explain		
20	Stem	Non-rotating, rising stem.	Yes / No / Explain		
21	Stem (dynamic) seal	By bellows with redundant gland packing. Between the bellows seal and the redundant gland packing, a tell-tale indicator pressure gauge shall be provided.	Yes / No / Explain		
22	Stem extension length (For ESBSG Valves)	As per BS 6364 or equivalent	Yes / No / Explain		
23	Plug	Renewable (replaceable) from stem	Yes / No / Explain		
24	Seat	Renewable from body with seat insert.(Alternatively Seat may be integral with body provided that it is harder than the plug insert)	Yes / No / Explain		
25	Shut off mode	Bi-directional shut off	Yes / No / Explain		
26	Flow direction	Flow-to-open (Flow-under-plug) and all the valves shall have Bi-directional shut-off.	Yes / No / Explain		
27	Material of construction: Body and bonnet	ASTM A 182 F 304/304L/ 316/316L/ 321 For ≤DN40 , ASTM A 351 CF 3/ 3M For ≥ DN50	Yes / No / Explain		
28	Stem, plug, seat	ASTM A 479 304/316/304L/ 316L/ 321	Yes / No / Explain		

29	Bellows	Stainless steel 316L/ 316Ti/ 321/ Hastealloy C 276/ Inconel 600/ 625/Incoloy	Yes / No / Explain		
30	Gland packing	PTFE/ Glass-filled PTFE/ PEEK/PCTFE (Kel-F)	Yes / No / Explain		
31	Plug & seat insert	PCTFE(Kel-F)/ Polycarbonate	Yes / No / Explain		
32	Pipe stub	Seamless pipe- ASTM A 312 TP 304L/316L	Yes / No / Explain		
33	Bolts	ASTM A 193 B 8	Yes / No / Explain		
34	Nuts	ASTM A 194 Gr 8	Yes / No / Explain		
35	Design code	BS5352 / BS 6364/ API 6-D/ ASME B16.34 or equivalent	Yes / No / Explain		
36	Test code	BS6755 / BS5155/ API 598/API 607 ASME B 16.34 or equivalent	Yes / No / Explain		
37	Note	1. The valves shall be either inherently anti-static or provided with anti-static features. 2. Alternative materials, if chosen as per manufacturer's standards, for any of the above parts the same shall be subject to approval by the purchaser.	Yes / No / Explain		
38	PNEUMATIC ACTUATOR: Type	Linear actuator, piston/ diaphragm type, single acting, spring return, fail-safe	Yes / No / Explain		
39	PNEUMATIC ACTUATOR: Normal position	As per Table 2A	Yes / No / Explain		

40	Command gas	Gaseous Nitrogen at 0.6 to 0.7 MPa(g) (Wherever the command gas is less than 0.55 MPa (g) suitable filter regulator shall be installed for each valve. The actuator & Air filter Regulator shall be suitably connected with tubings.)	Yes / No / Explain		
41	Failure position	Close- Normally closed valves Open- Normally open valves	Yes / No / Explain		
42	Response time (for both opening and closing strokes)	As per Table 2A If required, flow (volume) booster, necessary tubings and quick exhaust valve shall be incorporated to achieve the specified response time.	Yes / No / Explain		
43	End connection for command gas	Suitable NPT (F) to ASME B 1.10.1.	Yes / No / Explain		
44	Material	Carbon steel (enamel-painted)	Yes / No / Explain		
45	Test (along with valve assembly)	The response time taken for opening and closing of the valve shall be evaluated.	Yes / No / Explain		
46	STATUS SWITCHES	The valve shall be provided with a pair of non-contact type proximity status switches to indicate the “Open/Close” status of the valve. The status switches shall be mounted on the valve with such proper arrangement that does not require any adjustment/ alignment for the specified cycles of operation of the valve.	Yes / No / Explain		
47	Type	Cylindrical Inductive Type Proximity Sensor (switch) in accordance with NAMUR	Yes / No / Explain		

48	Sensing Distance	The sensing distance shall be suitably selected by the valve manufacturer according to the valve stroke length.	Yes / No / Explain		
49	Electrical Configuration	DC, 2 wire	Yes / No / Explain		
50	Nominal Voltage	8 V	Yes / No / Explain		
51	Operating Voltage	5 – 24 V	Yes / No / Explain		
52	Switching Frequency	0 to 500 HZ	Yes / No / Explain		
53	Reverse Polarity	Shall be Protected against reverse polarity	Yes / No / Explain		
54	Short-Circuit protection	Shall be Protected for short circuit	Yes / No / Explain		
55	Current Consumption:Not Sensing	≥ 3 mA	Yes / No / Explain		
56	Current Consumption:Sensing	≤ 1 mA	Yes / No / Explain		
57	Indication of switching state	LED	Yes / No / Explain		
58	Connection Type	2 metre long PVC Cable	Yes / No / Explain		
59	Ambient Temperature	- 25 degree Celsius to 80 degree Celsius	Yes / No / Explain		
60	Housing Material	Stainless Steel	Yes / No / Explain		
61	Protection Degree	IP 67	Yes / No / Explain		
62	Safety Aspects	Shall be intrinsically safe for Hydrogen (IIC) ambience	Yes / No / Explain		
63	Hazardous area Certification	The switches shall be intrinsically safe for Hydrogen environment in conformance with Ex ia IIC T6,Zone 1 of IEC/ATEX.The certificate of conformance to this effect from the accredited agency shall be provided.	Yes / No / Explain		

64	Note: Certificate matrix	Copy of Certificate matrix (including Make & Model) of the status switch shall be provided to the Department prior to procurement of status switches for its approval. Suggested Make: a. PEPPERL & FUCHS - Germany b. OMRON – USA c. Rockwell Automation – USA d. LongVale Ltd – UK e. Euroswitch - UK f. Cario Gavazzi g. IFM electronic	Yes / No / Explain		
65	Tests: a. Material test certificates	The material test certificates, detailing the physical and chemical properties, of the principal pressure–bearing parts shall be provided.	Yes / No / Explain		
66	b. Dimensional Inspection	All valves have to be subjected to dimensional inspection as per the approved drawings.	Yes / No / Explain		
67	c. Welding joint test (wherever applicable)	All butt welding joints in the valve (including the joints between the body and the pipe stubs) shall be subjected to dye-penetrant test and radiographic test with X-rays or gamma rays to 2% sensitivity as per Section IX, ASME. All the butt welding joints & socket welding joints shall be subject to dye-penetrant test.	Yes / No / Explain		

68	d. Bellows Cyclic life test	3 Sample bellows drawn from each batch of the same size and type shall be subject to (destructive) cyclic life (proto-type) test as per BS 5352/ relevant standards. If the Manufacturer of the bellows has already performed such test, copy of the certificate may be produced.	Yes / No / Explain		
69	e. Ultrasonic test	100% ultrasonic test shall be conducted for the pipe stubs.	Yes / No / Explain		
70	f. Soundness test for castings (wherever applicable)	All the castings shall be subject to soundness test with radiographic or ultrasonic technique for flaw detection.	Yes / No / Explain		
71	g. Pre-assembly hydraulic shell pressure test	The valve shell, prior to assembly with the bellows, in partially open position, shall be subjected to pressure test with Water (with suitable corrosion inhibitor) at 1.5 times the maximum rated working pressure of the particular pressure rating class of the valve.	Yes / No / Explain		
72	h. Pneumatic shell pressure test	The valve, upon final assembly including the bellows, in partially open position shall be subjected to pressure test with dry air or GN2 at 1.1 times the maximum rated working pressure of the particular pressure rating class.	Yes / No / Explain		
73	i. Pneumatic seat pressure test	The valve, in closed position, shall be subjected to pressure test at 1.1 times the maximum rated working pressure of the particular pressure rating class of the valve.	Yes / No / Explain		

74	j. MSLD shell leakage test	The valve in open position,the global leakage rate across body shall be measured with gaseous Helium Mass Spectrometer Leakage Detector (MSLD) to establish the permissible leakage rate values specified above by hood technique as per Article 10, Section V, ASME. The leakage test shall be performed by shrouding the entire outside surface of the valve with a plastic bag to hold gaseous Helium at a positive pressure and by evacuating and connecting the inlet/ outlet port to MSLD. Leakage test by detector probe or tracer probe technique is not acceptable.	Yes / No / Explain		
75	k. MSLD seat leakage test	The global leakage rate across seat shall be measured with gaseous Helium MSLD to establish the permissible leakage rate values specified above by hood technique as per Article 10, Section V, ASME. The leakage test shall be performed by pressurizing the inlet not less than 25% of Maximum rated working pressure of the particular pressure rating class of the valve with gaseous Helium and by evacuating and connecting the outlet to MSLD. Leakage test by detector probe or tracer probe technique is not acceptable.	Yes / No / Explain		

76	I. Functional Test	Each valve has to be subjected to functional test for verification of free operation of valves to the full stroke length.The response time taken for full opening and closing of the valve shall be evaluated.	Yes / No / Explain		
77	Cleanliness	All the interior flow surfaces of the valve shall be degreased and cleaned to Oxygen service standards as per CGA G-4.1 or MIL-C-52211 or ASTM G 93. The valves shall be dispatched with end connection sealed by suitable plastic plugs to avoid contamination during transportation.	Yes / No / Explain		
78	Marking	All the valves are assigned tag numbers for the sake of identification. The tag number for each valve, as indicated above, besides size, pressure rating class, material of construction, etc, shall be legibly and indelibly engraved on the body of the valves and its response time.	Yes / No / Explain		
79	List of Pneumatic Actuated Globe Valves	As per Table 2A	Yes / No / Explain		
80	Quality Assurance Plan (QAP)	As per Table 2B	Yes / No / Explain		

Document : Annexure 2

16. Pneumatically Actuated Cryogenic Globe Valve: Spares for Pneumatically actuated Cryogenic Globe valves (UVP 1002 & 1016) as per Technical specification & Special conditions attached in Annexure-2 & 4 respectively

17. Pneumatically Actuated Cryogenic Globe Valve: Supply of Pneumatically actuated Cryogenic Globe valves (UVP 1013 & 1015) as per Technical specification & Special conditions

attached in Annexure-2 & 4 respectively

Item specifications for Pneumatically Actuated Cryogenic Globe Valve

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	TECHNICAL SPECIFICATION OF PNEUMATICALLY-ACTUATED CRYOGENIC GLOBE VALVES	As per Annexure-2	Yes / No / Explain		
2	Valve : Type	Pneumatically-Actuated Extended stem Bellow sealed Cryogenic globe valve (PA-ESBSGV)	Yes / No / Explain		
3	Tag number	As per Table 2A	Yes / No / Explain		
4	Quantity	As per Table 2A	Yes / No / Explain		
5	Pattern	Globe	Yes / No / Explain		
6	Application	Shut-off/ isolation/ on-off	Yes / No / Explain		
7	Actuation	Pneumatic actuator	Yes / No / Explain		
8	Normal position	As per Table 2A	Yes / No / Explain		
9	Fluid medium	As per Table 2A	Yes / No / Explain		
10	Working temperature range	As per Table 2A	Yes / No / Explain		
11	Nominal size (mm)	As per Table 2A	Yes / No / Explain		
12	Maximum Allowable Working Pressure (MAWP)	As per Table 2A	Yes / No / Explain		
13	Valve coefficient	To be specified by the bidder in the quotation	Yes / No / Explain		
14	Permissible leakage rate across body	1E-7 Pa-m3/s (1E-6 mbar l/s.) of GHe	Yes / No / Explain		
15	Permissible leakage rate across Seat	1E-6 Pa-m3/s (1E-5 mbar l/s.)	Yes / No / Explain		

16	Guaranteed Cycle of operation	5000	Yes / No / Explain		
17	End connection	BW: Butt welding ends as per ASME B 16.9/ 16.25. Pipe stubs as per ASME B 36.19/ 36.10 of 100 mm length each shall be butt-welded to the body on either side, the ends of which shall be prepared for butt welding. The butt welding ends shall be suitable to mate with the interfacing pipe & schedule as per Table 2A.	Yes / No / Explain		
18	Style of construction: Body	With full port (standard bore) and in-line end connections	Yes / No / Explain		
19	Bonnet	Bolted or screwed to body with metal seals/ spring energized seals (such as Helicoflex, Enerseal, etc)/ any other suitable seals. The body bonnet joint shall be located on top of the stem extension such that the seal experiences near-ambient temperature. The stem extension shall be as per design code. The stem shall be of non rotating type.	Yes / No / Explain		
20	Stem	Non-rotating, rising stem.	Yes / No / Explain		
21	Stem (dynamic) seal	By bellows with redundant gland packing. Between the bellows seal and the redundant gland packing, a tell-tale indicator pressure gauge shall be provided.	Yes / No / Explain		
22	Stem extension length (For ESBSG Valves)	As per BS 6364 or equivalent	Yes / No / Explain		
23	Plug	Renewable (replaceable) from stem	Yes / No / Explain		

24	Seat	Renewable from body with seat insert.(Alternatively Seat may be integral with body provided that it is harder than the plug insert)	Yes / No / Explain		
25	Shut off mode	Bi-directional shut off	Yes / No / Explain		
26	Flow direction	Flow-to-open (Flow-under-plug) and all the valves shall have Bi-directional shut-off.	Yes / No / Explain		
27	Material of construction: Body and bonnet	ASTM A 182 F 304/304L/ 316/316L/ 321 For ≤DN40 , ASTM A 351 CF 3/ 3M For ≥ DN50	Yes / No / Explain		
28	Stem, plug, seat	ASTM A 479 304/316/304L/ 316L/ 321	Yes / No / Explain		
29	Bellows	Stainless steel 316L/ 316Ti/ 321/ Hastealloy C 276/ Inconel 600/ 625/Incoloy	Yes / No / Explain		
30	Gland packing	PTFE/ Glass-filled PTFE/ PEEK/PCTFE (Kel-F)	Yes / No / Explain		
31	Plug & seat insert	PCTFE(Kel-F)/ Polycarbonate	Yes / No / Explain		
32	Pipe stub	Seamless pipe-ASTM A 312 TP 304L/316L	Yes / No / Explain		
33	Bolts	ASTM A 193 B 8	Yes / No / Explain		
34	Nuts	ASTM A 194 Gr 8	Yes / No / Explain		
35	Design code	BS5352 / BS 6364/ API 6-D/ ASME B16.34 or equivalent	Yes / No / Explain		
36	Test code	BS6755 / BS5155/ API 598/API 607 ASME B 16.34 or equivalent	Yes / No / Explain		

37	Note	1. The valves shall be either inherently anti-static or provided with anti-static features. 2. Alternative materials, if chosen as per manufacturer's standards, for any of the above parts the same shall be subject to approval by the purchaser.	Yes / No / Explain		
38	PNEUMATIC ACTUATOR: Type	Linear actuator, piston/ diaphragm type, single acting, spring return, fail-safe	Yes / No / Explain		
39	PNEUMATIC ACTUATOR: Normal position	As per Table 2A	Yes / No / Explain		
40	Command gas	Gaseous Nitrogen at 0.6 to 0.7 MPa(g) (Wherever the command gas is less than 0.55 MPa (g) suitable filter regulator shall be installed for each valve. The actuator & Air filter Regulator shall be suitably connected with tubings.)	Yes / No / Explain		
41	Failure position	Close- Normally closed valves Open- Normally open valves	Yes / No / Explain		
42	Response time (for both opening and closing strokes)	As per Table 2A If required, flow (volume) booster, necessary tubings and quick exhaust valve shall be incorporated to achieve the specified response time.	Yes / No / Explain		
43	End connection for command gas	Suitable NPT (F) to ASME B 1.10.1.	Yes / No / Explain		
44	Material	Carbon steel (enamel-painted)	Yes / No / Explain		
45	Test (along with valve assembly)	The response time taken for opening and closing of the valve shall be evaluated.	Yes / No / Explain		

46	STATUS SWITCHES	The valve shall be provided with a pair of non-contact type proximity status switches to indicate the “Open/Close” status of the valve. The status switches shall be mounted on the valve with such proper arrangement that does not require any adjustment/ alignment for the specified cycles of operation of the valve.	Yes / No / Explain		
47	Type	Cylindrical Inductive Type Proximity Sensor (switch) in accordance with NAMUR	Yes / No / Explain		
48	Sensing Distance	The sensing distance shall be suitably selected by the valve manufacturer according to the valve stroke length.	Yes / No / Explain		
49	Electrical Configuration	DC, 2 wire	Yes / No / Explain		
50	Nominal Voltage	8 V	Yes / No / Explain		
51	Operating Voltage	5 – 24 V	Yes / No / Explain		
52	Switching Frequency	0 to 500 HZ	Yes / No / Explain		
53	Reverse Polarity	Shall be Protected against reverse polarity	Yes / No / Explain		
54	Short-Circuit protection	Shall be Protected for short circuit	Yes / No / Explain		
55	Current Consumption:Not Sensing	≥ 3 mA	Yes / No / Explain		
56	Current Consumption:Sensing	≤ 1 mA	Yes / No / Explain		
57	Indication of switching state	LED	Yes / No / Explain		
58	Connection Type	2 metre long PVC Cable	Yes / No / Explain		

59	Ambient Temperature	- 25 degree Celsius to 80 degree Celsius	Yes / No / Explain		
60	Housing Material	Stainless Steel	Yes / No / Explain		
61	Protection Degree	IP 67	Yes / No / Explain		
62	Safety Aspects	Shall be intrinsically safe for Hydrogen (IIC) ambience	Yes / No / Explain		
63	Hazardous area Certification	The switches shall be intrinsically safe for Hydrogen environment in conformance with Ex ia IIC T6,Zone 1 of IEC/ATEX.The certificate of conformance to this effect from the accredited agency shall be provided.	Yes / No / Explain		
64	Note: Certificate matrix	Copy of Certificate matrix (including Make & Model) of the status switch shall be provided to the Department prior to procurement of status switches for its approval. Suggested Make: a. PEPPERL & FUCHS - Germany b. OMRON – USA c. Rockwell Automation – USA d. LongVale Ltd – UK e. Euroswitch - UK f. Cario Gavazzi g. IFM electronic	Yes / No / Explain		
65	Tests: a. Material test certificates	The material test certificates, detailing the physical and chemical properties, of the principal pressure–bearing parts shall be provided.	Yes / No / Explain		
66	b. Dimensional Inspection	All valves have to be subjected to dimensional inspection as per the approved drawings.	Yes / No / Explain		

67	c. Welding joint test (wherever applicable)	All butt welding joints in the valve (including the joints between the body and the pipe stubs) shall be subjected to dye-penetrant test and radiographic test with X-rays or gamma rays to 2% sensitivity as per Section IX, ASME. All the butt welding joints & socket welding joints shall be subject to dye-penetrant test.	Yes / No / Explain		
68	d. Bellows Cyclic life test	3 Sample bellows drawn from each batch of the same size and type shall be subject to (destructive) cyclic life (proto-type) test as per BS 5352/ relevant standards. If the Manufacturer of the bellows has already performed such test, copy of the certificate may be produced.	Yes / No / Explain		
69	e. Ultrasonic test	100% ultrasonic test shall be conducted for the pipe stubs.	Yes / No / Explain		
70	f. Soundness test for castings (wherever applicable)	All the castings shall be subject to soundness test with radiographic or ultrasonic technique for flaw detection.	Yes / No / Explain		
71	g. Pre-assembly hydraulic shell pressure test	The valve shell, prior to assembly with the bellows, in partially open position, shall be subjected to pressure test with Water (with suitable corrosion inhibitor) at 1.5 times the maximum rated working pressure of the particular pressure rating class of the valve.	Yes / No / Explain		

72	h. Pneumatic shell pressure test	The valve, upon final assembly including the bellows, in partially open position shall be subjected to pressure test with dry air or GN2 at 1.1 times the maximum rated working pressure of the particular pressure rating class.	Yes / No / Explain		
73	i. Pneumatic seat pressure test	The valve, in closed position, shall be subjected to pressure test at 1.1 times the maximum rated working pressure of the particular pressure rating class of the valve.	Yes / No / Explain		
74	j. MSLD shell leakage test	The valve in open position,the global leakage rate across body shall be measured with gaseous Helium Mass Spectrometer Leakage Detector (MSLD) to establish the permissible leakage rate values specified above by hood technique as per Article 10, Section V, ASME. The leakage test shall be performed by shrouding the entire outside surface of the valve with a plastic bag to hold gaseous Helium at a positive pressure and by evacuating and connecting the inlet/ outlet port to MSLD. Leakage test by detector probe or tracer probe technique is not acceptable.	Yes / No / Explain		

75	k. MSLD seat leakage test	The global leakage rate across seat shall be measured with gaseous Helium MSLD to establish the permissible leakage rate values specified above by hood technique as per Article 10, Section V, ASME. The leakage test shall be performed by pressurizing the inlet not less than 25% of Maximum rated working pressure of the particular pressure rating class of the valve with gaseous Helium and by evacuating and connecting the outlet to MSLD. Leakage test by detector probe or tracer probe technique is not acceptable.	Yes / No / Explain		
76	l. Functional Test	Each valve has to be subjected to functional test for verification of free operation of valves to the full stroke length.The response time taken for full opening and closing of the valve shall be evaluated.	Yes / No / Explain		
77	Cleanliness	All the interior flow surfaces of the valve shall be degreased and cleaned to Oxygen service standards as per CGA G-4.1 or MIL-C-52211 or ASTM G 93. The valves shall be dispatched with end connection sealed by suitable plastic plugs to avoid contamination during transportation.	Yes / No / Explain		

78	Marking	All the valves are assigned tag numbers for the sake of identification. The tag number for each valve, as indicated above, besides size, pressure rating class, material of construction, etc, shall be legibly and indelibly engraved on the body of the valves and its response time.	Yes / No / Explain		
79	List of Pneumatic Actuated Globe Valves	As per Table 2A	Yes / No / Explain		
80	Quality Assurance Plan (QAP)	As per Table 2B	Yes / No / Explain		

Document : Annexure 2

18. Pneumatically Actuated Cryogenic Globe Valve: Spares for Pneumatically actuated Cryogenic Globe valves (UVP 1013 & 1015) as per Technical specification & Special conditions attached in Annexure-2 & 4 respectively

19. Cryogenic Globe Control Valve: Supply of Cryogenic Globe Control valve (UVC1001) as per Technical specification & Special conditions attached in Annexure-3 & 4 respectively

Item specifications for Cryogenic Globe Control Valve

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	TECHNICAL SPECIFICATION OF CRYOGENIC GLOBE CONTROL VALVE	The control valve shall comprise valve, actuator and smart positioner interconnected with SS tubing's as per Annexure-3	Yes / No / Explain		
2	Valve Type:	Pneumatically-actuated Extended stem Bellow sealed Cryogenic globe Control valve-ESBSGCV	Yes / No / Explain		
3	Tag number	As given in Table 3A	Yes / No / Explain		
4	Quantity	As given in Table 3A	Yes / No / Explain		

5	Pattern	Globe	Yes / No / Explain		
6	Application	Opening variable from 0 to 100 %	Yes / No / Explain		
7	Actuation	By pneumatic actuator	Yes / No / Explain		
8	Fluid medium	As given in Table 3A	Yes / No / Explain		
9	Working temperature range	As given in Table 3A	Yes / No / Explain		
10	Orifice diameter/ valve co-efficient (Cv)	To be calculated and given by the bidder along with quotation	Yes / No / Explain		
11	Nominal size of valve	To be given in the quotation by the bidder	Yes / No / Explain		
12	Inlet nominal pipe size x schedule number	As given in Table 3A	Yes / No / Explain		
13	Outlet nominal pipe size x schedule number	As given in Table 3A	Yes / No / Explain		
14	Maximum Allowable Working Pressure (MAWP) & Shut off pressure	As given in Table 3A	Yes / No / Explain		
15	Operating conditions: Inlet temperature	As given in Table 3A	Yes / No / Explain		
16	Operating conditions:Inlet pressure	As given in Table 3A	Yes / No / Explain		
17	Operating conditions:Outlet pressure	As given in Table 3A	Yes / No / Explain		
18	Operating conditions:Flow rate	As given in Table 3A	Yes / No / Explain		
19	Flow characteristic	Equal percentage	Yes / No / Explain		
20	Permissible Helium leakage rate across body	≤1E-7 Pa.m3/s of GHe (1E-6 mbar l/s of GHe)	Yes / No / Explain		
21	Permissible leakage rate across seat	Bubble tight	Yes / No / Explain		
22	Guaranteed cycle of operation	5000	Yes / No / Explain		
23	End connection	As given in Table 3A	Yes / No / Explain		

24	Flanged:	Serrated Raised Face (SRF) with serration flanges as per standard ANSI B 16.5 as given in Table 3A	Yes / No / Explain		
25	Style of construction: Body	With full port (standard bore) and in-line end connections	Yes / No / Explain		
26	Bonnet	Bolted or screwed to body with metal seals/ spring energized seals (such as Helicoflex, Enerseal, etc)/ any other suitable seals. The body bonnet joint shall be located on top of the stem extension such that the seal experiences near-ambient temperature. The stem extension shall be as per design code. The stem shall be of non rotating type.	Yes / No / Explain		
27	Stem	Non-rotating, rising stem	Yes / No / Explain		
28	Stem extension length	As per BS 6364	Yes / No / Explain		
29	Stem (dynamic) seal	By bellows with redundant gland packing. Between bellows seal and the redundant gland packing, a tell-tale indicator pressure gauge port with suitable plug shall be provided.	Yes / No / Explain		
30	Plug	Renewable (replaceable) from stem	Yes / No / Explain		
31	Seat	Renewable from body with seat insert.	Yes / No / Explain		
32	Flow direction	Flow-to-open (Flow-under-plug) and all the valves shall have Bi-directional shut-off	Yes / No / Explain		
33	Material of construction: Body and bonnet	ASTM A 182 F 304L/ 316L/ 321/304/316 (or) ASTM A 351 CF 3/3M/CF 8/8M	Yes / No / Explain		

34	Stem, plug, seat	ASTM A 479 304L/ 316L/ 321/304/316	Yes / No / Explain		
35	Bellows	Stainless steel 316L/ 316Ti/ 321/ Hastealloy C 276/ Inconel 600/ 625/ Incoloy	Yes / No / Explain		
36	Gland packing	PTFE/ Glass-filled PTFE/ PEEK	Yes / No / Explain		
37	Plug insert	PCTFE (Kel-F)/Polycarbonate	Yes / No / Explain		
38	Pipe stub (end connection)	ASTM A 312 TP 304L/316L	Yes / No / Explain		
39	Bolts	ASTM A 193 B8	Yes / No / Explain		
40	Nuts	ASTM A 194 Gr 8	Yes / No / Explain		
41	Design Code	ASME B16.34 or equivalent	Yes / No / Explain		
42	Test Code	ASME B 16.34/FCI 70.2 or equivalent	Yes / No / Explain		
43	Note:	1. The valves shall be either inherently anti-static or provided with anti-static features. 2.Alternative materials, if chosen as per manufacturer's standards, for any of the above parts the same shall be subject to approval by the purchaser.	Yes / No / Explain		
44	TESTS: a. Material test certificates	The material test certificates, detailing the physical and chemical properties, of the principal pressure–bearing parts shall be provided.	Yes / No / Explain		

45	b. Bellows cyclic life test	3 Sample bellows drawn from each batch of the same size and type shall be subjected to (destructive) cyclic life (proto-type) test as per BS 5352/relevant standards. If the manufacturer of the bellows has already performed such test, copy of the certificate may be produced.	Yes / No / Explain		
46	c. Welding joint test (wherever applicable)	All butt welding joints in the valve (including the joints between the body and the pipe stubs) shall be subjected to dye-penetrant test and radiographic test with X-rays or gamma rays to 2% sensitivity as per Section IX, ASME. All the socket welding joints shall be subject to dye-penetrant test (DPT).	Yes / No / Explain		
47	d. Functional Test	Each valve has to be subjected to functional test for free operation of valves to the full stroke length.	Yes / No / Explain		
48	e. Soundness test for castings (wherever applicable)	All the castings/Forgings/pipe/Machined pressure bearing components shall be subjected to soundness test with radiographic or ultrasonic technique for flaw detection.	Yes / No / Explain		

49	f. Pre-assembly hydraulic shell pressure test	The valve shell, prior to assembly, in partially open position, shall be subjected to pressure test with Water (with suitable corrosion inhibitor) at 1.5 times the maximum rated working pressure of the particular pressure rating class of the valve.	Yes / No / Explain		
50	g. Pneumatic shell pressure test	The valve, upon final assembly including the bellows, in partially open position shall be subjected to pressure test with dry air or GN2 at 1.1 times the maximum rated working pressure of the particular pressure rating class.	Yes / No / Explain		
51	h. Pneumatic Seat Pressure test	The valve, in closed position, shall be subject to pressure test at 1.1 times the maximum rated working pressure of the particular pressure rating class of the valve.	Yes / No / Explain		

52	i. MSLD shell leakage test	The valve in open position,the global leakage rate across body shall be measured with gaseous Helium Mass Spectrometer Leakage Detector (MSLD) to establish the permissible leakage rate values specified above by hood technique as per Article 10, Section V, ASME. The leakage test shall be performed by shrouding the entire outside surface of the valve with a plastic bag to hold gaseous Helium at a positive pressure and by evacuating and connecting the inlet/ outlet port to MSLD. Leakage test by detector probe or tracer probe technique is not acceptable.	Yes / No / Explain		
53	j. Ultrasonic test	100% ultrasonic test shall be conducted for the pipe subs.	Yes / No / Explain		
54	Cleanliness	All the interior flow surfaces of the valve shall be degreased and cleaned to Oxygen service standards as per CGA G-4.1 or MIL-C-52211 or ASTM G 93. The valves shall be dispatched with end connection sealed by suitable plastic plugs to avoid contamination during transportation.	Yes / No / Explain		

55	Marking	All the valves are assigned tag numbers for the sake of identification. The tag number for each valve, as indicated above, besides size, pressure rating class, valve coefficient, material of construction, etc, shall be legibly and indelibly engraved on the body of the valves.	Yes / No / Explain		
56	ACTUATOR: Type	Linear actuator, piston/ diaphragm type, single acting, spring return, fail-safe	Yes / No / Explain		
57	Normal position/ Failure position	As given in Table 3A	Yes / No / Explain		
58	Command gas	Gaseous Nitrogen at suitable pressure supplied by the positioner.	Yes / No / Explain		
59	Response time (for both full opening and closing strokes)	As given in Table 3A.If required, flow (volume) booster and quick exhaust valve shall be incorporated to achieve the specified response time.	Yes / No / Explain		
60	End connection for command gas	Suitable NPT (F) to ASME B 1.10.1.	Yes / No / Explain		
61	Material	Carbon steel (enamel-painted)	Yes / No / Explain		
62	Response time (for both full opening and closing strokes):	The response time taken for opening and closing of the valve shall be evaluated.	Yes / No / Explain		
63	Cv type test	Cv type test certificate shall be provided.	Yes / No / Explain		
64	SMART VALVE POSITIONER: a. Type	Microprocessor-based smart valve positioner integrated with valve position transmitter (Feed back module)	Yes / No / Explain		
65	b. Travel length	3 to 100mm for linear motion	Yes / No / Explain		

66	c. Position sensing	Contact type/ Inductive type	Yes / No / Explain		
67	d. Auto positioning	The positioner shall have provision to carry out auto tuning, which is selectable by hand-held communicator or by local switches	Yes / No / Explain		
68	e. Positioner characteristic	Equal percentage	Yes / No / Explain		
69	f. Positioner Input: Input	4 to 20 mA,2 wire Power supplied by the 4 to 20 mA current only. No external power supply.	Yes / No / Explain		
70	Input range	Range shall be configurable through hand held communicator or by local switches	Yes / No / Explain		
71	Voltage drop	10 V DC maximum at 20mA	Yes / No / Explain		
72	Minimum current	3.6 mA	Yes / No / Explain		
73	Communication	HART protocol, digital signal superimposed on the 4 to 20 mA current signal	Yes / No / Explain		
74	Reverse polarity protection	Reverse polarity shall not damage the positioner	Yes / No / Explain		
75	Command gas supply	Gaseous Nitrogen at 0.55 ± 0.1 MPa(g).(If the positioner or actuator is designed for lesser pressure, suitable pressure regulator along with filter shall be integrated with control valve by the supplier)	Yes / No / Explain		
76	g. Positioner Output: Output to actuator	0 to 100% command gas pressure	Yes / No / Explain		
77	Indication	4 ½ digit LCD indicator	Yes / No / Explain		
78	Feedback	2-wire, 4 to 20mA output corresponding to valve position.	Yes / No / Explain		

79	Output range	Shall be configurable through hand-held communicator or by local switches	Yes / No / Explain		
80	Flow characterization	Equal percentage	Yes / No / Explain		
81	Gain	Selectable through hand-held communicator or locally adjustable	Yes / No / Explain		
82	Travel time	Adjustable through hand-held communicator or locally adjustable	Yes / No / Explain		
83	h. Performance specification: Resolution (A/D conversion)	>4000 steps	Yes / No / Explain		
84	Sample rate	20ms	Yes / No / Explain		
85	Repeatability	0.1% of full scale	Yes / No / Explain		
86	Hysterisis	0.2% of full scale	Yes / No / Explain		
87	Command gas consumption	<0.25 Nm3/h	Yes / No / Explain		
88	Tolerance band/dead band	0.3 - 10% adjustable	Yes / No / Explain		
89	Operating temperature	233 to 358 K (-40 to 85 Degree Celsius)	Yes / No / Explain		
90	Vibration effect	≤ 0.1% upto 10g and 80Hz	Yes / No / Explain		
91	EMI effect	Comply with IEC60801	Yes / No / Explain		
92	i. Physical specification: Electrical connection	DN15 (1/2 NPT) as per ASME B 1.20.1	Yes / No / Explain		
93	Pressure gauge	Pressure gauges for supply and output command gas to be provided along with Air filter regulator.	Yes / No / Explain		
94	Mass	3 kg approximate	Yes / No / Explain		
95	Ingress protection class	IP 67	Yes / No / Explain		

96	Hazardous area certification	The positioner shall be intrinsically safe for Hydrogen environment in conformance with EEx ia IIC T6, Zone 1 of IEC/ATEX. The certificate of conformance to this effect from the accredited agency shall be provided.	Yes / No / Explain		
97	Make and Model number	To be specified by the bidder in the quotation	Yes / No / Explain		
98	Safe integrity level	SIL 2	Yes / No / Explain		
99	Suggested make	ABB, Germany SIEMENS Fischer	Yes / No / Explain		
100	List of Globe Control valve	As per Table 3A	Yes / No / Explain		
101	Quality Assurance Plan	As per Table 3B	Yes / No / Explain		

Document : Annexure 3

20. Cryogenic Globe Control Valve: Spares for Cryogenic Globe Control valve (UVC1001) as per Technical specification & Special conditions attached in Annexure-3 & 4 respectively

Common Specifications (Applicable for all items)

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	SPECIAL CONDITIONS	As per ANNEXURE- 4	Yes / No / Explain		
2	1. Guarantee/warranty	The valves shall be guaranteed/ warranted for satisfactory performance over a period of 18 months from the date of dispatch from the vendor's factory or 12 months from the date of commissioning at the purchaser's site, whichever is earlier.	Yes / No / Explain		

3	2. Delivery Period:	The delivery period for supply of all valves shall be within 9 months from the date of Purchase Order.	Yes / No / Explain		
4	3. Inspection	The Inspection of the valves shall be carried out by the Third Party Inspection (TPI) agency. The scope of inspection shall be as per the Quality Assurance Plan (QAP) given in Tables 1B, 2B & 3B and Technical specifications as given in Annexure 1, 2 & 3. TPI agency shall be chosen from the following list only: a. Lloyds Register Industrial Services Pvt Ltd (LRIS) b. Bureau Veritas Industrial Services Pvt Ltd (BVIS) c. Det Norske Veritas (DNV) d. Technischer Uberwachungs Verein (TUV) e. Bax Counsel Inspection Bureau Pvt Ltd It shall be the responsibility of the vendor to arrange for and coordinate with the TPI agency. Apart from Inspection by the TPI agency, the Purchaser's representative(s) shall also witness any test as may be deemed necessary at their discretion.	Yes / No / Explain		

5	4.Spares	The spare parts such as seals, seat etc required for maintenance of the valves shall be supplied. The detailed list of such spares shall be mentioned in the Part-I Techno commercial bid. The cost break up details for such spares shall be mentioned clearly in the Part-II Price bid. It is Purchaser's discretion to either select or delete the spares from the list. The bidder strictly should not indicate the price details in Techno Commercial bid (Part-I).The bid will be invalid if price details are indicated in any form.	Yes / No / Explain		
6	5.Documentation	The following documents (1 copy, in English) shall be provided by the vendor at the different stages specified thereupon: (The offer should contain two parts, Part-I Techno commercial bid & Part-II Price bid.)	Yes / No / Explain		
7	5.1 Along with Techno Commercial Bid (Part-I)	The following documents shall be provided.	Yes / No / Explain		
8	Techno Commercial Bid (Part-I) continued 1	5.1.1. Complete technical description of valves, including valve coefficient along with GA drawings, Make & model No. and catalogues of all the valves quoted. Sizing calculations for the control valves shall also be provided.	Yes / No / Explain		
9	Techno Commercial Bid (Part-I) continued 2	5.1.2. Deviations, if any, from the tender enquiry specification shall be explicitly spelt out. Otherwise it will be presumed that the offer is as per tender specification.	Yes / No / Explain		

10	Techno Commercial Bid (Part-I) continued 3	5.1.3. If any of the details required as per tender are not provided the offer will be summarily rejected.	Yes / No / Explain		
11	Techno Commercial Bid (Part-I) continued 4	5.1.4. The detailed list of Spares (without specifying the Price) such as seals, seat etc. of the valves shall be provided.	Yes / No / Explain		
12	Techno Commercial Bid (Part-I) continued 5	5.1.5. The bidder strictly should not indicate the price details in Techno Commercial bid (Part-I). The bid will be invalid if price details are indicated in any form.	Yes / No / Explain		
13	Techno Commercial Bid (Part-I) continued 6	5.1.6. The Bidder shall confirm that there is no mention or indication of any element of price whatsoever, as sum or percentage, in the Techno-commercial bid. Such information is to be given in the Price bid only.	Yes / No / Explain		
14	Techno Commercial Bid (Part-I) continued 7	5.1.7. The Bidder shall confirm their willingness to accept part order irrespective of price or quantity out of the quantity enquired.	Yes / No / Explain		
15	Techno Commercial Bid (Part-I) continued 8	5.1.8. Purchaser will assess and infer the capability of the bidder to meet the specifications based on the available information. In this regard, discretion of Purchaser will be final.	Yes / No / Explain		

16	Pre-Qualification Criteria (PQC) :	5.1.9. The Bidder's capability shall be evaluated based on the following Pre-Qualification (PQ) criteria. The Bidders shall suitably fill-up the information solicited in "Item specification" and submit as part of the Techno-Commercial Bid (TCB). Those Bidders who comply with the PQ criteria only will be screened-in for opening and evaluation of Price Bid. The information to be submitted in the TCB shall be complete in all respects substantiated by attached documents and there shall not be any further opportunity for the Bidders to submit any information or document unless the Purchaser solicits so at their own discretion. Any lack of information or incomplete/ ambiguous information or false information or information non-compliant with the PQ criteria shall be treated as sufficient cause to summarily reject such Bids.	Yes / No / Explain		
17	Pre-Qualification Criteria (PQC) Continued 1	5.1.9.1 The Bidder must be manufacturer or authorized agent/stockiest/distributor of the manufacturer. Manufacturer shall submit ISO certification to that effect. Agent / stockist / distributor shall submit Authorization letter from the manufacturer.	Yes / No / Explain		

18	Pre-Qualification Criteria (PQC) Continued 2	5.1.9.2 The bidder (or their Principal) must have successfully completed supply of Cryogenic globe valve of working temperature ≤ 80K AND Size DN25 or bigger in size AND Maximum Allowable Working Pressure (MAWP) 1.0 MPa or higher, during the last 7 years ending 31/07/2024. The claim shall be substantiated by purchase order(s) and inspection release note(s)/ acceptance certificate(s) by third-party inspection agency or client dated between 01/08/2017 and 31/07/2024.	Yes / No / Explain		
19	Pre-Qualification Criteria (PQC) continued 3	5.1.9.3 The Bidder (or their Principal) must have successfully completed supply of Cryogenic globe valves for price(s) as follows during the last 7 years ending 31/07/2024. The claim shall be substantiated by purchase order(s) and inspection release note(s)/ acceptance certificate(s) by third-party inspection agency or client dated between 01/08/2017 and 31/07/2024. a. 1 work (single purchase order) of price equal to or more than Rs 91.6 Lakhs. OR b. 2 works with price of each work equal to or more than Rs 57.25 lakhs. OR c. 3 works with price of each work equal to or more than Rs 45.8 lakhs.	Yes / No / Explain		

20	Pre-Qualification Criteria (PQC) continued 4	5.1.9.4 The Bidder must possess the facility for performing sensitive leak test of the valves using Helium Mass Spectrometer Leak Detector (MSLD). In case of authorized agent/stockiest/distributor, certificate for seat leak test of Valve from the manufacturer or their principal shall be provided. The claim shall be substantiated by Test report issued/ countersigned by Third-party inspection agency or client evidencing seat leakage rate equal to or finer than 1E-6 Pa.m^3/s (1x10^-5 mbar.l/s) for at least one valve during the period between 01/08/2017 and 31/07/2024.	Yes / No / Explain		
21	5.2 Along with Price bid (Part-II):	The bidder shall indicate the price break-up details such as basic valve price, testing charges, inspection charges, spares price, freight, taxes & duties, packing & forwarding charges, etc.	Yes / No / Explain		

22	5.3 Within 2 WEEKS from placement of purchase order	The following documents shall be provided. These documents are subject to review by the purchaser. Only upon receipt of the Purchaser's approval of these documents, the vendor shall proceed with manufacture of the valves. However, the purchaser's approval shall not absolve the vendor of their responsibility to comply with the specification of purchase order. 5.3.1 General Arrangement (GA) drawing, indicating the overall dimensions of the product along with the accessories. 5.3.2 Detailed cross sectional/ fabrication drawing of the valve, indicating the dimensions,plug & seat arrangement and Material of Construction (MOC) of each part. 5.3.3 Sizing calculations for control valve.	Yes / No / Explain		

23	5.4 Upon satisfactory inspection of the valves	The following documents shall be provided. The purchaser shall review these documents for compliance with the specification of the purchase order and issue “purchaser’s delivery clearance”. Only upon receipt of the same, the vendor shall proceed with delivery of the valves.Valves shall be properly packed in order to avoid damages during handling and transportation. 5.4.1 Certificates of tests specified in Annexure 1, 2 & 3 shall be authorized by the inspector. 5.4.2 Inspection report by the inspector.	Yes / No / Explain		
24	5.5 Along with the consignment	The following documents shall be provided: 5.5.1 Instruction manual for installation, operation, maintenance and trouble-shooting. 5.5.2 Guarantee/ Warranty certificate.	Yes / No / Explain		

Supporting Documents required from Vendor

1. Price break up for Spares (in price bid only) as per clause 4 of Annexure – 4 (Price Bid Related)

2. Documentary evidence for Manufacturing of Globe valves as per clause 5.1.9.1 of Annexure-4

3. Documentary evidence for supply of Cryogenic globe valve of working temperature ≤ 80K AND Size DN25 or bigger in size AND Maximum Allowable Working Pressure (MAWP) 1.0 MPa or higher as per clause 5.1.9.2 of Annexure-4

4. Documentary evidence for Supply of Cryogenic Globe valves for Price(s) as per clause 5.1.9.3 of Annexure – 4

5. Documentary evidence for sensitive leak test of valves using Helium Mass Spectrometer leak

Detector (MSLD) as per clause 5.1.9.4 of Annexure – 4

6. GA.Drawings and catalogues for all valves

7. Sizing Calculations for Control valve

8. Deviations,if any from Tender specifications

9. Complete Technical description of all valves,including valve coefficient

5 additional documents can be uploaded by the vendor

C.2 Commercial Terms / Bid

Sl. No.	Description	Compliance	Vendor Terms
1	Technical Specification of Cryogenic Globe Control valve as per Annexure- 3	Yes / No / Explain	
2	Technical Specification of Pneumatically-Actuated Cryogenic Globe valves as per Annexure 2	Yes / No / Explain	
3	Technical Specification of Manual Cryogenic Globe valves as per Annexure-1	Yes / No / Explain	
4	Special conditions as per Annexure-4	Yes / No / Explain	
5	Taxes and other costs, if any: (Specify)	Yes / No / Explain	
6	Validity of Offer (specify)	Yes / No / Explain	
7	Delivery Period (specify)	Yes / No / Explain	
8	Delivery Terms: Normal delivery terms - FOR Destination (i.e., IPRC, Mahendragiri)	Yes / No / Explain	
9	PAYMENT TERMS - Our normal payment terms is 100% within 30 days of receipt and acceptance of the items (No advance payment allowed). Specify your payment terms.	Yes / No / Explain	

10	Security Deposit: To ensure due execution of the Purchase Order, Vendor shall submit an interest free Security Deposit equivalent to 3% of the order value within 15 days from the date of receipt of Purchase Order. Security Deposit can be submitted by way of Bank Guarantee (as per format enclosed on ÃÂÃÂÃÂÃÂÂ¢ÃÂÃÂÃÂÃÂÃÂÃÂÃÂÃÂÃÂÃÂ Â¹ 200/- stamp paper) from any Nationalized/ Scheduled Bank in favor of Accounts Officer, IPRC. The Bank Guarantee should be valid for 60 days beyond the scheduled delivery date. Security Deposit can be submitted by way of Fixed Deposit Receipt (lien marked to Accounts Officer, IPRC)/Demand Draft in favor of Accounts Officer, IPRC. In case of BG, confirmation for issued BG may be sent by issuing Bank/Branch to ÃÂÃÂÃÂÃÂÂ¢ÃÂÃÂÃÂÃÂÃÂÃÂÃÂÃÂÃÂÃÂ Â IFSC Code: SBIN0000880; SBI, Nagercoil Branch. In case of non-execution of the Purchase Order within the stipulated delivery period, IPRC reserves the right to cancel the Purchase Order and forfeit the Security Deposit. However, based on request from the Vendor, in case IPRC agree to extend the delivery period with applicability of Liquidated Damages or otherwise, the validity of the Bank Guarantee should be suitably extended. It may be noted that adjustment of Security Deposit from the progressive payment/final bill is not permitted.	Yes / No / Explain	
11	Confirm: Conditions for BIDDER FROM A COUNTRY WHICH SHARES LAND BORDER WITH INDIA	Yes / No / Explain	
12	Name of PRINCIPAL, Address, Contact No, E-mail Id etc. (specify):	Yes / No / Explain	
13	Name of INDIAN AGENT, Address, Contact No, E-mail Id etc. (specify):	Yes / No / Explain	
14	Currency quoted (specify)	Yes / No / Explain	
15	Warranty / Guarantee Period: (specify)	Yes / No / Explain	

16	Taxes and other costs, if any: (specify).	Yes / No / Explain	
17	Liquidated Damages - Delivery is the essence of the order. If delivery is delayed beyond the stipulated delivery period, LD at 0.5% per week shall be recovered subject to a maximum of 10% of order value of undelivered items	Yes / No / Explain	
18	Performance Bank Guarantee (PBG): In order to ensure due performance of warranty obligation, Vendor shall submit a Performance Bank Guarantee (PBG) equivalent to 3% of the order value. The PBG can be submitted by way of Bank Guarantee (as per format enclosed on ÃÂÃÂÃÂÃÂÂ¢ÃÂÃÂÃÂÃÂÃÂÃÂÃÂÃÂÃÂÃÂ Â¹ 200/- stamp paper) from any Nationalized/Scheduled Bank in favor of Accounts Officer, IPRC. The Bank Guarantee should be valid for 60 days beyond the scheduled warranty period. In case the warranty period is extended due to any reasons, the validity of the Bank Guarantee shall also be extended suitably. PBG can be submitted by way of Fixed Deposit Receipt (lien marked to Accounts Officer, IPRC)/Demand Draft in favor of Accounts Officer, IPRC also. The PBG will be forfeited in case of non-performance of warranty obligation. In case of BG, confirmation for issued BG may be sent by issuing Bank/Branch to ÃÂÃÂÃÂÃÂÂ¢ÃÂÃÂÃÂÃÂÃÂÃÂÃÂÃÂÃÂÃÂ Â IFSC Code: SBIN0000880; SBI, Nagercoil Branch. In case a Purchase Order requires submission of Security Deposit and Performance Bank Guarantee, Vendor has the option to submit a combined Bank Guarantee for Security Deposit and Performance Bank Guarantee within 15 days from the date of receipt of Purchase Order and valid for 60 days beyond completion of the warranty period/all contractual obligation. In case PBG is submitted by way FDR (lien marked to Accounts Officer, IPRC or Demand Draft (in favor of Accounts Officer, IPRC).	Yes / No / Explain	
19	Percentage of Local Content with documentary proof: (specify)	Yes / No / Explain	

20	If MSME, provide documentary proof: (specify)	Yes / No / Explain	

C.3 Price Bid

Sl. No.	Item	Quantity	Unit Price	Currency	Total Price	Remark
1	Manual Cryogenic Globe Valve: Supply of Manual Cryogenic Globe valves (UVM 1001,1003,1004, 1005,1012 & 1013) as per Technical specification & Special conditions attached in Annexure- 1 & 4 respectively	6.00 Nos.		-		
2	Manual Cryogenic Globe Valve : Spares for Manual Cryogenic Globe valves (UVM 1001,1003,1004, 1005,1012 & 1013) as per Technical specification & Special conditions attached in Annexure- 1& 4 respectively	1.00 Sets		-		

3	Manual Cryogenic Globe Valve: Supply of Manual Cryogenic Globe valve (UTV 1001) as per Technical specification & Special conditions attached in Annexure-1 & 4 respectively	1.00 Nos.		-		
4	Manual Cryogenic Globe Valve : Spares for Manual Cryogenic Globe valve (UTV 1001) as per Technical specification & Special conditions attached in Annexure- 1 & 4 respectively	1.00 Sets		-		
5	Pneumatically Actuated Cryogenic Globe Valve: Supply of Pneumatically actuated Cryogenic Globe valves (UVP 1004 & 1005) as per Technical specification & Special conditions attached in Annexure- 2 & 4 respectively	2.00 Nos.		-		

6	Pneumatically Actuated Cryogenic Globe Valve: Spares for Pneumatically actuated Cryogenic Globe valves (UVP 1004 & 1005) as per Technical specification & Special conditions attached in Annexure- 2 & 4 respectively	1.00 Sets		-		
7	Pneumatically Actuated Cryogenic Globe Valve: Supply of Pneumatically actuated Cryogenic Globe valves (UVP 1001,1003,1006,1007,1008,1010 & 1014) as per Technical specification & Special conditions attached in Annexure-2 & 4 respectively	7.00 Nos.		-		
8	Pneumatically Actuated Cryogenic Globe Valve: Spares for Pneumatically actuated Cryogenic Globe valves (UVP 1001,1003,1006,1007,1008,1010 & 1014) as per Technical specification & Special conditions attached in Annexure-2 & 4 respectively	1.00 Sets		-		

9	Pneumatically Actuated Cryogenic Globe Valve: Supply of Pneumatically actuated Cryogenic Globe valve (UVP 1011) as per Technical specification & Special conditions attached in Annexure-2 & 4 respectively	1.00 Nos.		-		
10	Pneumatically Actuated Cryogenic Globe Valve: Spares for Pneumatically actuated Cryogenic Globe valve (UVP 1011) as per Technical specification & Special conditions attached in Annexure-2 & 4 respectively	1.00 Sets		-		
11	Pneumatically Actuated Cryogenic Globe Valve: Supply of Pneumatically actuated Cryogenic Globe valve (UVP 1009) as per Technical specification & Special conditions attached in Annexure-2 & 4 respectively	1.00 Nos.		-		

12	Pneumatically Actuated Cryogenic Globe Valve: Spares for Pneumatically actuated Cryogenic Globe valve (UVP 1009) as per Technical specification & Special conditions attached in Annexure-2 & 4 respectively	1.00 Sets		-		
13	Pneumatically Actuated Cryogenic Globe Valve: Supply of Pneumatically actuated Cryogenic Globe valve (UVP 1012) as per Technical specification & Special conditions attached in Annexure-2 & 4 respectively	1.00 Nos.		-		
14	Pneumatically Actuated Cryogenic Globe Valve: Spares for Pneumatically actuated Cryogenic Globe valve (UVP 1012) as per Technical specification & Special conditions attached in Annexure-2 & 4 respectively	1.00 Sets		-		

15	Pneumatically Actuated Cryogenic Globe Valve: Supply of Pneumatically actuated Cryogenic Globe valves (UVP 1002 & 1016) as per Technical specification & Special conditions attached in Annexure-2 & 4 respectively	2.00 Nos.		-		
16	Pneumatically Actuated Cryogenic Globe Valve: Spares for Pneumatically actuated Cryogenic Globe valves (UVP 1002 & 1016) as per Technical specification & Special conditions attached in Annexure-2 & 4 respectively	1.00 Sets		-		
17	Pneumatically Actuated Cryogenic Globe Valve: Supply of Pneumatically actuated Cryogenic Globe valves (UVP 1013 & 1015) as per Technical specification & Special conditions attached in Annexure-2 & 4 respectively	2.00 Nos.		-		

18	Pneumatically Actuated Cryogenic Globe Valve: Spares for Pneumatically actuated Cryogenic Globe valves (UVP 1013 & 1015) as per Technical specification & Special conditions attached in Annexure-2 & 4 respectively	1.00 Sets		-		
19	Cryogenic Globe Control Valve: Supply of Cryogenic Globe Control valve (UVC1001) as per Technical specification & Special conditions attached in Annexure-3 & 4 respectively	1.00 Nos.		-		
20	Cryogenic Globe Control Valve: Spares for Cryogenic Globe Control valve (UVC1001) as per Technical specification & Special conditions attached in Annexure-3 & 4 respectively	1.00 Sets		-		

Common charges (Applicable for all items)

P & F	
Freight	

TPI charges (%)	
Testing charges (%)	
Other charges if any (%)	
3. Other Charges in Price (If any)	
1. Other Charges in Price (If any)	