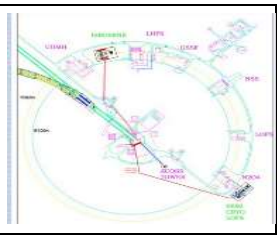
AUGMENTED FACILITIES AT SLP COMPLEX (ASLP)
SDSC SHAR, SRIHARIKOTA
****

REQUEST FOR PROPOSAL (RFP)

Technical Specification for Supply of Valves for Foam system at ASLP facilities

SATISH DHAWAN SPACE CENTRE
Indian Space Research Organization
Department of Space, Government of India
Sriharikota 524124
Tirupati District, Andhra Pradesh State, India



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INTRODUCTION

Satish Dhawan Space Centre (SDSC-SHAR), Indian Space Research Organization (ISRO), Department of Space, Government of India, Andhra Pradesh 524124, Nellore District, Andhra Pradesh State, India (hereinafter referred to as "Department") **intends to provide Foam based fire suppression systems (For ISROsene handled areas) to the newly established and Augmented facilities at Second Launch pad (SLP) Complex, SDSC SHAR viz., ISROsene Storage, ISROsene DPT facility, Mobile Launch Pedestal (MLP) & Umbilical Tower (UT) at SLP complex.**

The Department hereby issues the Request for Proposal (RFP) document to the Capable Bidders to supply the following items.

Sl.No.	Description of the works to be carried out	Qty.
1	Supply of Valves for Foam system at ASLP facilities as per the specifications **Section- A to Section-B**.	**1Lot*** (Refer Table-1 for schedule of quantities)

Note: * One Lot consists of the following schedules of the quantities given in Table -1.

SCHEDULE OF QUANTITIES: TABLE-1

Sl. No.	DESCRIPTION	Units	Quantity
1.0	**Supply of SS Manual Ball valves and spares kit as per the specification in Chapter-01 (Unit cost inclusive of spares cost)**		
1.1	150NB SS MANUAL BALL VALVE FLANGED 150#	Nos.	3
1.2	100NB SS MANUAL BALL VALVE FLANGED 150#	Nos.	8
1.3	80NB SS MANUAL BALL VALVE FLANGED 150#	Nos.	10
1.4	50NB SS MANUAL BALL VALVE FLANGED 150#	Nos.	15
1.5	40NB SS MANUAL BALL VALVE FLANGED 150#	Nos.	10
1.6	25NB SS MANUAL BALL VALVE FLANGED 150#	Nos.	25
1.7	15NB SS MANUAL BALL VALVE FLANGED 150#	Nos.	60
1.8	25NB SS MANUAL BALL VALVE SOCKET WELDED 800#	Nos.	20
1.9	15NB SS MANUAL BALL VALVE SOCKET WELDED 800#	Nos.	25
1.10	25NB SS MANUAL BALL VALVE NPT THD 800#	Nos.	20
1.11	15NB SS MANUAL BALL VALVE NPT THD 800#	Nos.	45
2.0	**Supply of SS Electro Pneumatic Ball valves as per the specification in Chapter-02**		
2.1	80NB SS EP BALL VALVE, FLANGED 150#	Nos.	3
2.2	50NB SS EP BALL VALVE, FLANGED 150#	Nos.	15
2.3	40NB SS EP BALL VALVE, FLANGED 150#	Nos.	4
2.4	25NB SS EP BALL VALVE, FLANGED 150#	Nos.	8
	Supply of Spares for SS Electro Pneumatic Ball valves as per the specification in Chapter-02		
2.5	80NB SS EP BALL VALVE, FLANGED 150#	Sets	2
2.6	50NB SS EP BALL VALVE, FLANGED 150#	Sets	2
2.7	40NB SS EP BALL VALVE, FLANGED 150#	Sets	2
2.8	25NB SS EP BALL VALVE, FLANGED 150#	Sets	2

Sl. No.	DESCRIPTION	Units	Quantity
3.0	**Supply of Electro Pneumatic Wafer Type Butterfly Valves as per specifications in Chapter-03**		
3.1	300 NB EP WAFER TYPE BUTTERFLY VALVE	Nos.	2
3.2	200 NB EP WAFER TYPE BUTTERFLY VALVE	Nos.	7
3.3	150 NB EP WAFER TYPE BUTTERFLY VALVE	Nos.	3
3.4	100 NB EP WAFER TYPE BUTTERFLY VALVE	Nos.	10
	Supply of EP Butterfly Valve soft spares kit for above units as per specifications in Chapter-03		
3.5	300 NB EP WAFER TYPE BUTTERFLY VALVE	Sets	2
3.6	200 NB EP WAFER TYPE BUTTERFLY VALVE	Sets	2
3.7	150 NB EP WAFER TYPE BUTTERFLY VALVE	Sets	2
3.8	100 NB EP WAFER TYPE BUTTERFLY VALVE	Sets	2
	Supply of EP Valve Actuator spares kit for above units as per specifications in Chapter-03		
3.9	300 NB EP WAFER TYPE BUTTERFLY VALVE	Sets	2
3.10	200 NB EP WAFER TYPE BUTTERFLY VALVE	Sets	2
3.11	150 NB EP WAFER TYPE BUTTERFLY VALVE	Sets	2
3.12	100 NB EP WAFER TYPE BUTTERFLY VALVE	Sets	2
4.0	**Supply of CS Manual Ball valves as per the specification in Chapter-04**		
4.1	40NB MANUAL BALL VALVE FLANGED 150#	Nos.	5
4.2	25NB MANUAL BALL VALVE FLANGED 150#	Nos.	10
4.3	15NB MANUAL BALLVALVE FLANGED 150#	Nos.	10
4.4	25NB MANUAL BALL VALVE SOCKET WELDED 800#	Nos.	20
4.5	15NB MANUAL BALL VALVE SOCKET WELDED 800#	Nos.	20
4.6	25NB MANUAL BALL VALVE NPT THD 800#	Nos.	25
4.7	15NB MANUAL BALL VALVE NPT THD 800#	Nos.	45
	Supply of Spares for above CS Manual ball valves as per the specification in Chapter-04		
4.8	40NB MANUAL BALL VALVE FLANGED 150#	Sets	2
4.9	25NB MANUAL BALL VALVE FLANGED 150#	Sets	2
4.10	15NB MANUAL BALLVALVE FLANGED 150#	Sets	2
4.11	25NB MANUAL BALL VALVE SOCKET WELDED 800#	Sets	4
4.12	15NB MANUAL BALL VALVE SOCKET WELDED 800#	Sets	4
4.13	25NB MANUAL BALL VALVE NPT THD 800#	Sets	4
4.14	15NB MANUAL BALL VALVE NPT THD 800#	Sets	5
5.0	**Supply of CS Manual Butterfly valves as per the specification in Chapter-05**		
5.1	200 NB MANUAL BUTTERFLY VALVE	Nos	16
5.2	150 NB MANUAL BUTTERFLY VALVE	Nos	08
5.3	100 NB MANUAL BUTTERFLY VALVE	Nos	12
5.4	80 NB MANUAL BUTTERFLY VALVE	Nos	10
5.5	50 NB MANUAL BUTTERFLY VALVE	Nos	10
	Supply of spare gear units for operation of above Manual butterfly valves of the following sizes as per the specification in Chapter-05		
5.6	200 NB MANUAL BUTTERFLY VALVE	Sets	2
5.7	150 NB MANUAL BUTTERFLY VALVE	Sets	2

Note-1:

Wherever, spares are mentioned each spare set/kit shall comprise only soft seals, seats, gaskets & O-rings related to that particular items.

The execution period from release of purchase order to final acceptance shall be considered as 7 **months**. As this Project is of national interest and to be completed within the stipulated period, the Bidders are advised to take utmost care in studying the quantum & nature of work and plan adequate & suitable resources to execute the purchase order within the stipulated period while submitting the bids.

This specification document is organized in two sections as follows.

Section - A General Terms and Conditions & Technical Specification for Supply of Valves
Section - B Formats to be submitted by bidder

SECTION – A
GENERAL TERMS & CONDITIONS

1. Cost of Bidding:

All direct and indirect costs associated with the preparation, submission of bid shall be to Bidder's account, and SDSC SHAR will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bid process.

2. Commercial Terms:

2.1. Taxes:

2.1.1 GST

As per Ministry of Finance Dept. of Revenue Notification No. 25/2018 –Integrated Tax (Rate) (Schedule-I, Sl. No. 243B) (Amendment to Notification No. 7/2018-Integrated Tax (Rate) dated 25.01.2018 and Notification No. 1/2007-Integrated Tax (Rate) dated 28.06.2017) for raw materials, spares, tools and consumables etc., required for launch vehicles applicable GST is 5%. Suppliers are requested to submit your offer by considering **GST@5%**

2.1.2 Income Tax

Income tax at the prevailing rate as applicable and if applicable from time to time shall be deducted from the supplier's bills as per Income Tax Act and a certificate issued (TDS Certificate).

2.2. Delivery Period:

Seven months (07) from purchase order release date.

2.3. Terms of Payments

Our standard payment terms will be 100% on pro-rata within 30 days after receipt and acceptance of the items at our site.

2.4. Liquidated Penalty (LP):

Since delivery is the essence of this order, LP @ 0.5% per week or part thereof subject to a maximum of 10% of PO value for the delayed period of supply.

2.5. Warranty:

Warranty for the offered item shall be from the date of acceptance of the item at our site for a minimum period of 18 months or specified in the tender document.

2.6. Performance Bank Guarantee (PBG):

The contractor has to submit a PBG from a Nationalized / Scheduled Bank for 3% of the order value at the time of supply valid till the completion of warranty period plus 60 days towards claim period. OR 3% of the order value shall be hold till the completion of warranty period

2.7. Security Deposit (SD):

3% value of the order shall be deposited with SDSC within 10 days from the date of the Purchase Order towards security deposit in the form of Bank Guarantee towards performance of the Contract valid till completion of the contract period plus sixty days towards claim period. (This will be returned by SDSC immediately on execution of the order satisfactorily as per order terms. If not, the amount will be forfeited).

2.8. Validity of Offer:

The validity of the offers / tenders should be 120 days from the date of opening of the tenders. Tenders shorter than offer validity mentioned above will not be considered for evaluation. Bidder has to quote for all the items listed in the Technical specification (Section- B), Schedule of quantities without which the offer will not be considered.

2.9. Make in India:

General Terms & conditions for Bidders: For this procurement, bids from Class-I & class-II Local Suppliers are admissible. Hence provisions contained in Public Procurement (Preference to Make in India), Order 2017 issued by Department for Promotion of Industry and Internal Trade (DIPP), Ministry of Commerce & Industries vide letter No. P-45021/2/2017-PP (BE-II) dated 04.06.2020 and subsequent amendment & directives shall be followed. Accordingly, offer will be evaluated & processed in conformation with above referred GOI order (Specially mentioned below). The bidder shall provide compliance and undertaking as per order and hereafter amendments:

(a) Order no: F.No.6/18/2019 PPD dated 23.07.2020 of Department of Expenditure), Ministry of Finance under Public procurement division for the General Financial rule (GFRs).
(b) Class-I local supplier means a supplier or service provider, whose goods, service or works offered for procurement, has local content equal to or more than 50%, as defined under order.
(c) Class-II local supplier means a supplier or service provider, whose goods, services or works offered for procurement, has local content more than 20% but less than 50%, as defined under this Order
(d) Verification of local content:

(i) The Class I local supplier/ Class- II local supplier at the time to tender, bidding or solicitation shall be required to indicate percentage of local content and provide self-certification that the item offered meets the local content requirement for Class-I local supplier / Class II local supplier as the case may be. They shall also give details of the location(s) at which the local value addition is made.
(ii) In case bid value is in excess of Rs. 10 Cr., Class-I local supplier / Class-II local supplier shall be required to provide a certificate from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content.
(iii) False declarations will be in breach of the code of Integrity under Rule 175(1) (i) (h) of the General Financial Rules (GFR) for which a bidder or its successors can be debarred for up to two years as per Rule 151(iii) of the general Financial Rules along with such other actions as may be permissible under Law.
(iv) A supplier who has been debarred by any procuring entry for violation of this order shall not be eligible for preference under this order for procurement by any other procuring entity for the duration of the debarment.

(e) The percentage of local content should be specifically mentioned in the offer; without which it will be summarily rejected.
(f) Preference will be given to Class-I Local supplier and in their absence, Class-II Local supplier will be considered.

In case tenderers offering items considering customs duty exemption, they should also indicate the bill of materials and price, separately, with Customs Duty component and terms and conditions thereto.

3. Ambiguity:

Should there be any ambiguity or doubt as to the meaning of any of the tender clause/condition or if any further information is required, the matter shall be immediately brought to the notice of Head, Purchase & Stores of SDSC SHAR in writing.

4. Force majeure

For the purpose of the contract, the term "force majeure" shall means strikes, lockouts and other conflicts, acts of an enemy, war hostile blockade, disturbance of the public order, stroke of lightning, fire under thunderstorm, flood explosion and acts of god and government acts beyond the reasonable control of the party claiming force majeure. If due to circumstances of force of majeure, either of the parties to this contract partially of completely unable to fulfil its obligations in accordance with this contract, the said party shall be obligated to immediately inform the other party of occurrence of the circumstances of force majeure in

writing. The party claiming force majeure shall also be obligated to keep the other party informed of the events in the process related to the occurrence of the said force majeure circumstances and of the possible degree of non-fulfilment or delay in fulfilment of the obligations in accordance with this contract. All the obligations of the party that invokes the plea of force majeure shall be suspended as long as the said force majeure circumstances continues to exist and not longer, and the said party shall not be regarded as having committed breach or failure, nor shall be held responsible to make compensation for losses suffered by either party. The terms of fulfilment of the obligation shall be duly extended for the period during which the circumstances of force majeure lasts. The fulfilment of the obligations shall be resumed immediately after the cessation of the said circumstances of force majeure. If the said force majeure circumstances last for more than sixty days, parties to this Contract shall discuss and agree upon further action. Should the state of non-fulfilment of obligation under the Contract be more than three (3) months and nothing could be done to make a statement about ceasing of obligations of Contract, within not more than three (3) months either party has the right to cancel the Contract mentioned below. The ownership of all materials, parts and unfinished work paid for by the SDSC SHAR shall vest with the SDSC SHAR or transferred to the SDSC SHAR as soon as they have paid for. The amount of compensation payable/recoverable shall be fixed on the basis of evidence produced by party and acceptable by the purchaser.

5. Arbitration

In the event of any dispute/s, difference/s or claim/s arising out of or relating to the interpretation and application of the Order, such dispute/s or difference/s or claim/s shall be settled amicably by mutual consultations of the good Offices of the respective Parties and recognizing their mutual interests attempt to reach a solution satisfactory to both the parties. If such a resolution is not possible, within 30 days from the date of receipt of written notice of the existence of such dispute/s, then the unresolved dispute/s or difference/s or claim/s such dispute/s, then the unresolved dispute/s or difference/s or claim/s shall be referred to the Sole Arbitrator appointed by the Parties by mutual consent in accordance with the rules and procedures of Arbitration and Conciliation Act 1996 as amended from time to time. The arbitration shall be conducted in Bengaluru in the Arbitration and Conciliation Centre - Bengaluru (Domestic and International) as per its rules and regulations. The expenses for the Arbitration shall be shared equally or as may be determined by the Arbitrator. The considered and written decision of the Arbitrator shall be final and binding between the Parties. The applicable language for Arbitration shall be "English" only. Work under the Order shall be continued by you during the pendency of arbitration proceedings, without prejudice to a final adjustment in accordance with the decision of the Arbitrator unless otherwise directed in writing by the DEPARTMENT or unless the matter is such that the works cannot be possibly continued until the decision (whether final or interim) of the Arbitrator is obtained.

6. Secrecy clause:

The party shall take all reasonable steps necessary to ensure that all persons employed in connection with the Purchase Order have full knowledge of the Official Secrets Act and the regulations framed there under. Any breach of the aforesaid conditions shall entitle the purchaser to cancel the Purchase Order and if necessary, to go ahead with the purchase at the risk and cost of the party in addition to any other penal action it may take at its discretion.

7. Confidentiality and proprietary right protection:

The party shall be obliged to preserve the confidentiality of the proprietary information received, exchanged between each other during the period of the Contract. Technical documentation published and/or claimed for a patent shall be effected by both the parties only on mutual decisions and approval of both the parties, during the existence of this agreement.

8. Exclusion of Tenders

The following tenders shall be summarily rejected from the procurement process: -

Unsolicited tenders from vendors.

i. The tenders who materially depart from the requirements specified in the tender document or which contain false information.
ii. The tenders of vendors who have not agreed to furnish Advance Bank Guarantee or Performance Bank Guarantee.
iii. The validity of the tenders is shorter than the period specified in the tender enquiry.
iv. The tenders received from vendors or their agents or anyone acting on their behalf, which have promised or given to any official of the Centre/Unit/Department, a gratification in any form, or anything of value, so as to unduly influence the procurement process.
v. The tenders received from vendors, who, in the opinion of the Centre/Unit, have a conflict of interest materially affecting fair competition.
vi. The tenders received from Indian agents on behalf of their foreign Principals/OEMs (in cases where the Principals/OEMs also submit their tenders simultaneously for the same item/product in the same tender).
vii. In case two or more tenders are received from an Indian agent on behalf of more than one foreign Principal/OEM, in the same tender for the same item/product.
viii. If a firm quote 'NIL' charges / consideration, the bid shall be treated as un-responsive and will not be considered.

9. Instructions to the Bidder

In case of any conflict/contradiction, the documents shall prevail over one another in the following order:

i. For all commercial, contractual and general conditions, Notice Inviting Tender (NIT).
ii. Any contradiction either between various parts of document or in the content of the document itself shall be a matter of clarification to be obtained by the bidder from the purchaser. The purchaser's decision shall be final and binding.
iii. The Bidder shall study the specification. This technical specification is only guidance to the bidder.
iv. The Bidder shall satisfy the department that he possesses the necessary technical experience for the items to be supplied. Necessary particulars in this regard shall be furnished with the offer.
v. Any changes or difficulties which might be encountered during the execution of supply or any other problems due to local conditions which are not anticipated / included in the tender document shall fall under full obligations of the successful Bidder. No claim on account of the same and for any ambiguity in any respect will be entertained after placement of order by Purchaser.
vi. The items covered in this specification shall conform to the technical specification, general requirements and relevant latest standards / codes in respect of dimensions, size, material, manufacture, inspection, testing etc. as applicable.
vii. All material, dimensional standards, tolerances, process of fabrication and testing procedures shall be in accordance with the latest revision of the standard codes specified in this Tendering Specification.
viii. Materials used for fabrication shall be new and the best of their kind and shall comply with the latest revisions of all relevant standards.
ix. Bidder shall clearly indicate the deviations taken from the Tender documents/specifications separately in his offer.
x. Compliance statement to the technical specification given is to be duly signed & stamped and submitted as a part of acceptance.
xi. Deviations, if any, w.r.t technical and commercial terms & conditions shall be clearly brought out and deviation list to be added. If deviations are not listed separately, it will be presumed that the bidder is adhering to all the technical specifications and commercial terms & conditions given in this document.
xii. Transportation & Transit Insurance are fully in the scope of supplier and the same shall be borne by the party.
xiii. The Bidder shall quote item wise units and unit price and total units and total price of items to be supplied under this specification.
xiv. Bids will be evaluated as per the Format-11 in Section-B.
xv. Bids meeting minimum qualification criteria as per the Format-10 of Section-B only will be considered for evaluation.

xvi. Supplier shall submit all the formats of Section-B duly filled & signed along with the offer.

xvii. Compliance statement to the technical specification given is to be duly signed & stamped and submitted as a part of acceptance.

xviii. Detailed QAP shall be submitted by the party after placement of order. Quality Assurance Plan mutually agreed by successful bidder and purchaser shall be complied. Party shall confirm the broad guidelines mentioned in the technical specification document.

xix. The sectional drawings with material of construction of all parts and QAP (Quality Assurance Plan) shall be sent to purchaser for approval before commencing production. The supplier shall guarantee that the valves supplied shall be exactly as per the approved drawing in all aspects.

xx. Inspection of Valves shall be carried out by the Purchaser prior to dispatch at Manufacturers site as per approved QAP.

xxi. The supplier shall ensure that QAP is strictly followed in all stages of manufacturing, Testing & Inspection.

xxii. The supplier has to inform the purchaser, the readiness of the materials for inspection well in advance for arranging the purchaser's representative for inspection at works. The items shall be dispatched only after inspection of the valves completed by the purchaser's inspection engineers at works and after dispatch clearance given by the purchaser.

xxiii. Prior to dispatch of the items, Supplier shall forward the below referred documentations in confirmation with approved QAP to the purchaser

- Data sheets & Drawings of the Valve along with Actuator, Accessories & Pneumatic circuit diagrams
- Test reports of bought out items like actuators, limit switches and any other components etc.
- Complete Test documentation as specified in QAP

xxiv. Dispatch clearance will be provided by the purchaser, upon review of the Test Documents

xxv. At the time of dispatch of items, 3 sets of production master files comprising the following shall be supplied.

- Final Inspection / clearance report.
- Final Datasheets & drawings
- Test Reports
- Operational and Maintenance manual
- Material Test certificates of wetted parts.
- Part list and spares list

xxvi. Supplier shall give confirmation for acceptance of part order.

xxvii. **Delivery of Valves:** Supplier has to complete the manufacturing, assembly, testing of EP valves and deliver to SDSC-SHAR within 7 months from the date of release of Purchase order. The following is the tentative schedule.

Sl. No	Description of activity	Time line
1	Date of Release of Purchase order	T_0
2	Submission of Detailed QAP, Datasheets & Drawings for approval	T_0 + 2 weeks
3	Approval of Detailed QAP, Datasheets & Drawings	T_0 + 4 weeks
4	Completion of Inspection by Purchaser at Manufacturer premises	T_0 + 6 months
5	Delivery of the items to SDSC SHAR, Sriharikota	T_0 + 7 months

Technical Specifications for Supply of Valves

Specification for Scope of supply:

The brief specifications for each of the supply items is available in the corresponding sections as indicated in following Table-A.

Table-A

Sl. No.	Description of the item to be supplied	Refer Chapter for specifications
1	Specifications for SS Manual Ball Valves	Chapter - 01
2	Specifications for SS Electro pneumatic Ball Valves	Chapter - 02
3	Specifications of Electro Pneumatic Wafer Type Butterfly Valves	Chapter - 03
4	Specifications for CS Manual Ball Valve	Chapter - 04
5	Specifications for Manual Butterfly Valves (Wafer)	Chapter - 05

Chapter-01

Specifications for SS Manual Ball Valves

1. Technical Specifications

Item Description	Detailed Specification for	
	S.S Socket weld/ Threaded-NPT(Female) type ball valves	**S.S Flanged type ball valves**
Type	Regular Bore (Full bore/port), Three piece Floating Ball valve	Full bore, One/ Two piece Floating Ball valve
End connections	Socket Weld (SW)/Threaded (NPT-Female) Conforming to ANSI B16.11	RF Flanged confirming to ANSI B16.5, 150#
Class rating	800#	150#
Face to face dimensions	As per BS5351/ANSI B 16.10/ ANSI B 16.34/	As per ANSI B 16.10
Mode of operation	Hand Lever	Hand Lever
Design code	BS5351/ISO 17292	BS5351/ISO 17292
Antistatic Device	To be provided	To be provided
Blowout proof stem	To be provided	To be provided
Fire safe	-	BS 6755 Part – II/API 607/ EN 12266 Part-II
Leakage Class	As per ANSI B16.104 Class VI/ FCI 70.2 -100% Bubble Tight shut off/ Zero Leak /Rate-A	As per ANSI B16.104 Class VI/ FCI70.2 -100% Bubble Tight shut off/Zero leak /Rate-A
Testing code	BS 6755 Part -l/API 598/EN 12266 Part-l/ISO 5208	BS 6755 Part -l/API 598/EN 12266 Part-l/ISO 5208
Service/Fluid handled	AFFF 3% (Aqueous Film Forming Foam concentrate)	AFFF 3% (Aqueous Film Forming Foam concentrate)
Material of Construction		
Body and Ball Material	CF8M / SS316L	CF8M / SS316
Seat Material	PTFE /RPTFE	PTFE /RPTFE
Stem, Stem bush, Stem nuts, Spacer Material	SS 316	SS 316
Lever material	SS304	SS304
Body seal/Gasket	Graphite/PTFE/RPTFE	Graphite/PTFE/RPTFE
Stem seal: Stem packing/0-ring	Graphite/PTFE/RPTFE	Graphite/PTFE/RPTFE
Bolting / Nuts	A 193 Gr. B8M/A 194 Gr 8M	A 193 Gr. B8M/A 194 Gr 8M
Valve Castings	Radiography Quality (If required as per standard)	Radiography Quality (If required as per standard)
Castings/ Forgings	Solution Annealed	Solution Annealed

2. Schedule for SS Manual Ball Valves

Sl. No.	Description	Units	Qty.
1	150NB SS MANUAL BALL VALVE FLANGED 150#	Nos.	3
2	100NB SS MANUAL BALL VALVE FLANGED 150#	Nos.	8
3	80NB SS MANUAL BALL VALVE FLANGED 150#	Nos.	10
4	50NB SS MANUAL BALL VALVE FLANGED 150#	Nos.	15
5	40NB SS MANUAL BALL VALVE FLANGED 150#	Nos.	10
6	25NB SS MANUAL BALL VALVE FLANGED 150#	Nos.	25
7	15NB SS MANUAL BALL VALVE FLANGED 150#	Nos.	60
8	25NB SS MANUAL BALL VALVE SOCKET WELDED 800#	Nos.	20
9	15NB SS MANUAL BALL VALVE SOCKET WELDED 800#	Nos.	25
10	25NB SS MANUAL BALL VALVE NPT THD 800#	Nos.	20
11	15NB SS MANUAL BALL VALVE NPT THD 800#	Nos.	45

3. General Conditions for SS Ball Valves:

i No welding shall be attempted on the valve body / parts.

ii The valve offered shall be guaranteed for proper performance for a period of minimum of 18 months form the date of receipt and acceptance.

iii Test certificate for compliance with Fire Safe design as per BS6755 Part - 2/ API-607 / EN 12266 Part-II should be submitted.

iv The sectional drawings with material of construction of all parts and QAP (Quality Assurance Plan) shall be sent to purchaser for approval before commencing production. The supplier shall guarantee that the valves supplied shall be exactly as per the approved drawing in all aspects.

v The supplier shall ensure that QAP is strictly followed in all stages of manufacturing, Testing & Inspection.

vi Inspection of valves shall be carried out by the Purchaser prior to dispatch at manufacturers site as per approved QAP.

vii The supplier has to inform the purchaser, the readiness of the materials for inspection well in advance for arranging the purchaser's representative for inspection at works. The items shall be dispatched only after inspection of the valves completed by the purchaser's inspection engineers at works and after dispatch clearance given by the purchaser.

viii All castings (valve body) shall be of radiographic quality. All castings shall be of investment casting. For all the valves, radiography test shall be carried out on one sample selected at random for each size and class. Radiography shall be carried out, one sample selected at random for each size and radiography evaluation reports shall be submitted during inspection of valves.

ix Prior to dispatch of the items, Supplier shall forward the below referred documentations in confirmation with approved QAP to the purchaser

- Data sheets & Drawings of the Valve
- Test reports of bought out items.
- Complete Test documentation as specified in QAP

x Dispatch clearance will be provided by the purchaser, upon review of the above documents

xi At the time of dispatch of items, 3 sets of production master files comprising the following shall be supplied.

- Final Inspection / clearance report.
- Final Datasheets & drawings
- Test Reports
- Operational and Maintenance manual
- Material Test certificates of wetted parts.
- Part list and spares list

xii The valves shall be punched with details like, size, class rating, material of construction etc.
xiii All castings shall be solution annealed to ASTM A 351 S11.1.
xiv All flanged faces shall be Raise Face (RF), serrated.
xv Ball shall be of solid construction for all sizes. Hollow Ball construction is not acceptable.
xvi All valves shall be painted with high epoxy paint with aliphatic polyurethane final coat and total DFT shall be 150+/- 10µ. Painting shall be carried out after our final inspection.
xvii **Supply of Spare kits:** Consisting of Seats, Seals, O-rings, Gland packing seals etc., for below SS Manual Ball valves. Spare kits shall be neatly packed to avoid damage during transit.

Sl. No.	Description	Units	Qty.
1	150NB SS MANUAL BALL VALVE FLANGED 150#	Sets	2
2	100NB SS MANUAL BALL VALVE FLANGED 150#	Sets	2
3	80NB SS MANUAL BALL VALVE FLANGED 150#	Sets	2
4	50NB SS MANUAL BALL VALVE FLANGED 150#	Sets	3
5	40NB SS MANUAL BALL VALVE FLANGED 150#	Sets	2
6	25NB SS MANUAL BALL VALVE FLANGED 150#	Sets	5
7	15NB SS MANUAL BALL VALVE FLANGED 150#	Sets	5
8	25NB SS MANUAL BALL VALVE SOCKET WELDED 800#	Sets	5
9	15NB SS MANUAL BALL VALVE SOCKET WELDED 800#	Sets	4
10	25NB SS MANUAL BALL VALVE NPT THD 800#	Sets	4
11	15NB SS MANUAL BALL VALVE NPT THD 800#	Sets	5

Note: Supplier should include the cost of spare kits against cost of respective valves mentioned in Table-1 Schedule of Quantities.

4. Quality Assurance Plan for SS Ball Valves

Sl. No.	Characteristics / type of check	Ref. Document.	Method of check	Quantum of check	
				Supplier's Q.C	Purchaser's inspection
1	Chemical Analysis of Body, Bonnet, Ball & Stem per heat / lot	Customer P O/ Approved drgs.	Verification of Material test certificates	R 100%	R 100%
2	Mechanical Testing (Yield, Tensile & Elongation) of Body, Bonnet, Ball & Stem per heat / lot	Customer P O/ Approved drgs.	Verification of Material test certificates	R 100%	R 100%
3	Solution Annealing per heat / lot	Customer P O/ Approved drgs	Verification of MTCs/Heat charts	R 100%	R 100%
4	Verification of IGC test reports of body, bonnet & ball per heat / lot	ASTM A262 practice B or E	Verification of IGC test Certificates.	R 100%	R 100%
5	Radiography on critical areas	ASME B.16.34	Review of radiographs	R 100%	R 100 %
6	Dimensional and visual inspection	Customer Approved drgs.	Measurement/ visual	R 100%	W (RN) 10%
7	Valve assembly	Customer P O/ Approved drgs.	Bill of material /visual	H 100%	R 10 %

8	Hydro Shell / body test	BS 6755 Part - l/API 598/ EN 12266 Part-l/ ISO 5208	Testing on RIG (Min 1 No per size)	H 100%	W (RN) 10%
9	Hydro/ Pneumatic seat test		Testing on RIG (Min 1 No per size)	H 100%	W (RN) 10%
10	Valve identification Tagging/labeling on valve/Protection	Customer P O	Visual	H 100%	W (RN) 10%
11	Valve coating /painting	Customer P O/ Approved drgs	Review of paint DFT measurement report	H 100%	R 100%
12	Final documentation	AS per PO Approved drgs	Verification of Documents/ Certificates	H 100%	R 100%

Legend: H-Hold, R-Review, W-Witness, RN-Randomly

Chapter-02

Specifications for SS Electro Pneumatic Ball Valves

1. Technical Specifications:

1.1 Type: - Two-way EP Ball Valve with Pneumatic Actuator and Limit Switches & spare kits

Sl.No	Description	Detailed Specification
1	End Connection	RF Flanged with serration to ANSI B 16.5
2	Port	Full Bore
3	Construction	2 pieces
4	Operating Temperature	50 ^{0}C
5	Service/Fluid handled	AFFF 3% (Aqueous Film Forming Foam concentrate)
6	Design Code	BS 5351/ ISO 17292
7	Testing Code	BS 6755 Part-I/ EN 12266 Part 1/API 598/ ISO 5208
8	Anti-static Device	Yes, to be provided
9	Operation	By direct mounted pneumatic actuator
10	Fire Safe Design	BS6755 Part - 2/ API-607 / EN 12266 Part-II

1.2 Preferable MAKE/Equivalent meeting specifications: (The following combination may be selected. The suppliers may offer all possible options so that required combinations may be selected accordingly.)

Actuator	Limit switch	Limit switch enclosure
Virgo / El-O-Matic / Bettis /Automax Supernova / Norbro / Rotadisc / Valvia / Flowserve	Honeywell / Omeron	TopWorxs / Emerson / Virgo Westlock

1.3. Material of Construction of Valve: -

S.No	Description	Material
1	Body	SS 316
2	Stem	SS 316
3	Gland	SS 316
4	Ball	SS 316 (Solid bar) or CF8M Cast one
5	Seat	PTFE
6	Gland packing seals	PTFE/Graphite
7	Body seals	PTFE/Graphite
8	Bolting	A 193 Gr. B8M/A194 Gr. 8M
9	Heat treatment	Solution annealing for all castings as per standard ASTM A 351
10	Inspection	By Supplier's Quality Control Department & Purchaser's representative prior to dispatch as per QAP at Manufacturer's Place

1.4 Actuators: -

Sl.No	Description	
1	Type	Spring return, single acting piston & Direct Mounted as per ISO STD. Links shall be of Stainless Steel.
2	Input signal	Min 5 bar (g) of N_2 gas/Air nominal 7 bar (g)
3	Angle of rotation	90Deg (with a provision on the actuator to adjust the angle of rotation)
4	Response time along with valve	Min 2 – 4 seconds (for opening) Min 4 – 6 seconds (for closing)
5	Failure position	Normally closed
6	Body material	Extruded Aluminum Alloy Internally Hard anodized, externally coated with Polyurethane/ Epoxy powder
7	Piston & Rack	Anodized die cast Aluminum
8	Air supply connections	¼"BSPP, Female
9	Springs	Cartridge type multi springs of material spring Steel, Electro Static
Note: Optimum torque should be selected for each size of valve actuator. For interpolated torque values, next higher value should be chosen. However torque values shall be detailed in the offer.		

1.5 Limit Switches: -

The specified Micro-Switch assemblies housed in Flame proof and weatherproof enclosure will be mounted on Actuator for monitoring the ON/OFF status of Electro Pneumatic Valves.

Sl.No	Description	
1	Type	Heavy Duty, SPDT Switches
2	No. of switches for each valve	4 nos. (2 Nos. for ON and 2 nos. for OFF Status)
3	Contacting Rating	As per standard
4	Operating Temperature	50 Deg.C

The Micro-Switches shall be mechanical contact type. The three wires/leads from each of the Micro-Switches shall be sealed at switch side and other end terminated on terminal blocks (shall be of Wago type, not screw type)/PCB. It means all the 12 leads from all the micro switches shall be terminated on terminal blocks/PCB. However, total 15 nos. of terminal blocks including spares shall be provided inside each enclosure.

1.6 Limit Switch Enclosure: -

All the four no. of Micro-Switches, 15 nos. of terminal blocks, spring loaded rotary cams for position setting along with connecting shaft etc., shall be housed inside the enclosure as specified below:

Sl.No	Description	
1	Material of Construction	Aluminum Alloy
2	Degree of protection	IP 65 or better
3	Electrical Classification	Flame proof suitable for Zone 0/1 Group II C environment certified by BASEEFA or equivalent International Agency/ IS 2148 Gr. II C.
4	Cable Entry	¾" NPT (female) 2 nos. (1 no. to be plugged) One no. of ¾"NPT suitable double compression gland (GR-IIC) shall be supplied with each enclosure
5	Local ON/OFF indication	Impact Resistant Thermoplastic (Preferable). To be mounted on Micro-Switch assembly
6	Mounting Accessories	All fittings, connectors, screws, Circlips etc. shall be of SS 304 /316 only & the scope includes the supply of coupling and mounting bracket links also
7	Cams for switches	Individual cam with adjustment Provision for each Micro-Switch to be provided
Note: Interface brackets and couplings, Bolts, circlips etc. shall be of SS 304/316 only.		

1.7 Intrinsically Safe Direct Operated Dual Redundant Solenoid Valve

1	Make & Model	:	Norgren Herion / Parker/ equivalent to be specified by vendor meeting the following specifications.
2	Solenoid valve Type	:	Intrinsically Safe with Dual Coil & Dual Valve (1 Main + 1 Redundant) Energizing any one or both the coils should operate the pneumatic actuator at the output port. Direct operated for continuous operation. Redundant valve design, High availability design. Safe venting, high availability design with SS tubing SS304/SS316/SS304L/ SS316L. The model no of quoted solenoid valve to be specified by vendor.
3	**Valve Specifications**		
a	Valve type	:	3/2 Way Universal, 1/4" Solenoid valve, Direct acting Poppet type, Intrinsically safe
b	Type of operation	:	Normally closed
c	Operating temperature	:	-20 to 60 deg C
d	Orifice size .	:	≥ 5 mm
e	Operating Pressure & medium	:	0 to 10 bar (nominal) of dry GN2/Air (Direct operated)
f	Material of construction	:	SS304 / SS316 /S S304L / SS316L with SS internals and SS mounting screws
g	Internal seals	:	VITON / NBR (Perbunan) seals
h	Process End connection	:	¼" NPT(F) Inlet, Outlet & vent port. Suitable SS silencer/mufflers shall be supplied.
4	**Solenoid coil specifications**		
a	No. of coils	:	Two
b	Type of coil and operation	:	Intrinsically safe and Electromagnetic
c	Operating voltage	:	DC operated suitable to operate with P&F make Intrinsically Safe barrier KCD0-SD3-Ex1.1245 / KCD0-SD3-Ex1.1045. Entity parameters of solenoid coil shall be suitable for the barrier. The solenoid coil in combination with the above mentioned IS barrier shall support a minimum of 500m of 0.5 sq mm cable loop resistance (Considering loop resistance (Out and return) of 80.2Ω / Km at 20^{o}C) in IIC area.
d	Cable entry	:	½" NPT (F) / M20 x 1.5. SS Double compression cable gland shall be provided.
e	Solenoid Enclosure	:	Die Cast/Hard Anodized Aluminium housing and cover with Epoxy (or) Fibre reinforced plastic housing and cover.
f	Coil Insulation Class	:	H

g	Termination	:	Coil with Embedded screw terminals/terminal block
h	Environmental classification	:	IP 66
i	Electrical classification	:	EEx ia IIC T4/T6 valve shall be conforming to ATEX/PTB certified for use in zone I and gas group II C.
j	Approvals	:	ATEX/CCOE approved-PTB certified. SIL-3 or better for independent solenoid coil and valve combination.

2. Schedule for SS Electro pneumatic ball valves

Sl. No.	Description	Units	Qty.
1	80NB SS EP BALL VALVE, FLANGED 150#	Nos.	3
2	50NB SS EP BALL VALVE, FLANGED 150#	Nos.	15
3	40NB SS EP BALL VALVE, FLANGED 150#	Nos.	4
4	25NB SS EP BALL VALVE, FLANGED 150#	Nos.	8

3. General Conditions for SS EP Ball valve: -

a. Valve to be supplied shall be strictly as per specification, deviation if any from specification will lead to rejection of offer.
b. OFFER should contain cross-sectional drawings & relevant brochures/ catalogues of valves, Actuator, Limit Switches and Limit switch housing.
c. The offer should contain the gland packing details (Location & number of seals and material of construction of seals) in Cross sectional drawings.
d. Test certificate for compliance with Fire Safe design as per BS6755 Part - 2/ API-607 / EN 12266 Part-II should be submitted.
e. The sectional drawings with material of construction of all parts and QAP (Quality Assurance Plan) shall be sent to purchaser for approval before commencing production. The supplier shall guarantee that the valves supplied shall be exactly as per the approved drawing in all aspects.
f. No welding is allowed on the valve body. All valves up to 2" size shall be made of investment castings. Bar stock construction is not acceptable.
g. All sealing & seating materials shall be compatible with fluids given in the specifications. During approval of fabrication drawings, the purchaser reserves right to suggest suitable materials if offered materials are not compatible with fluids.
h. ISO interface for mounting pneumatic actuator to be provided on the valve body.
i. Valve actuators shall be provided with sintered mufflers on vent side.
j. Solenoid valves for actuator are also in the scope of supply.
k. Make of Valve, Actuator and Limit Switches shall be as per our indent specifications or Equivalent makes meeting the specifications.
l. All fasteners shall be SS316.
m. **Foundry / Material test certificates of all wetted parts of the valves** and all other test certificates like, Body hydro test, Leak test, Functional test, etc., shall be furnished to the purchaser at the time of inspection.
n. **IGC testing** shall be conducted as per ASTM A262 Practice-B or E on valve bodies on one sample for each heat/lot no.
o. **Radiography** shall be carried out on critical areas for one number in each size valves randomly selected as per ASME B16.34 and radiography evaluation reports shall be submitted during inspection of valves.
p. All valves shall have stem seal arrangement to meet the fugitive emission test (FET) version & fire safe version. Type test certificates for fire safe test as per API 607 / BS EN 12264 part-II shall be furnished along with the offer and at the time of inspection.

q. Test certificates from appropriate testing and certifying authorities for explosion proof for specified class and protection class of **Limit Switch Enclosures** shall be obtained and furnished at the time of inspection without which the items cannot be cleared during inspection.
r. Prices Quoted shall be inclusive of all testing charges including radiography charges.
s. The supplier shall ensure that QAP is strictly followed in all stages of manufacturing, Testing & Inspection.
t. Inspection of valves shall be carried out by the purchaser prior to dispatch at manufacturers site as per approved QAP.
u. The supplier has to inform the purchaser, the readiness of the materials for inspection well in advance for arranging the purchaser's representative for inspection at works. The items shall be dispatched only after inspection of the valves completed by the purchaser's inspection engineers at works and after dispatch clearance given by the purchaser.
v. The valves shall be tagged with size, class rating and material of construction of body, manufacturers reference no. etc.
w. All valves shall be painted with high epoxy paint with aliphatic polyurethane final coat and total DFT shall be 150± 10µ. Painting shall be carried out after our final inspection.
x. The valve offered shall be guaranteed for proper performance for a period of minimum 18 months from the date of receipt and acceptance.
y. Prior to dispatch of the items, Supplier shall forward the below referred documentations in confirmation with approved QAP to the purchaser
    - Data sheets & Drawings of the Valve along with Actuator, Accessories & Pneumatic circuit diagrams
    - Test reports of bought out items like actuators, limit switches and any other components etc.
    - Complete Test documentation as specified in QAP
z. Dispatch clearance will be provided by the purchaser, upon review of the above documents
aa. At the time of dispatch of items, 3 sets of production master files comprising the following shall be supplied.
    - Final Inspection report
    - Final Drawings & Datasheets
    - Operational and Maintenance manual
    - Material Test certificates & IGC
    - Hydro & Pneumatic test reports
    - Part list and spares list.

bb. **Supply of Spare Kits:** Consisting of Ball valve spare kits and Actuator spare kits for below mentioned SS EP Ball valves. Spare kits(Seats, Body seals, Gland packing seals, etc.) shall be neatly packed to avoid damage during transit.

Sl. No.	Description	Units	Qty.
1	80NB SS EP BALL VALVE, FLANGED 150#	Sets.	2
2	50NB SS EP BALL VALVE, FLANGED 150#	Sets.	2
3	40NB SS EP BALL VALVE, FLANGED 150#	Sets.	2
4	25NB SS EP BALL VALVE, FLANGED 150#	Sets.	2

4. Quality Assurance Plan for SS Electro pneumatic ball valves:

Sl.No	Characteristics / type of check	Ref. Document.	Method of check	Quantum of check	
				Supplier 's Q.C	Purchaser rep.
1	Chemical Analysis of Body, Bonnet, Ball & Stem per heat / lot	Customer P O/ Approved drwg.	Verification of Material test certificates.	R 100%	R 100%
2	Mechanical Testing (Yield, Tensile & Elongation) of Body, Bonnet, Ball & Stem per heat / lot	Customer P O/ Approved drwg.	Verification of Material test certificates.	R 100%	R 100%
3	Solution annealing per heat / lot	Customer P O/ Approved drwg.	Verification of MTCs/Heat charts.	R 100%	R 100%
4	Verification of IGC test reports of body, bonnet & ball per heat / lot	ASTM A262 practice B or E	Verification of IGC test Certificates.	R 100%	R 100%
5	Radiography on critical areas	ASME B.16.34.	Review of radiographs	R 100%	R 100 %
6	Dimensional and visual inspection	Customer approved drwg.	Measurement/ visual	R 100%	W (RN) 10%
7	Hydro shell/Body test	BS 6755 Part-I/ EN 12266 Part 1/API 598/ ISO 5208	Testing on RIG (Min 1 No per size)	H 100 %	W (RN) 10%
8	Hydro/ Pneumatic seat test		Testing on RIG (Min 1 No per size)	H 100 %	W (RN) 10%
9	Functional test with actuators and limit switches	As per P O/ Approved drwg.	Performance of On/OFF status of valves	H 100%	W (RN) 10%
10	Valve identification tagging/labeling on valve/ protection	Customer P O	Visual	H 100 %	W (RN) 10%
11	Valve coating / painting	Customer P O/ Approved drwgs	Review of paint DFT measurement report	H 100%	R 100%
12	Final Documentation	As per P O/ Approved drwg.	Verification of Documents/ Certificates	H 100 %	R 100%

Legend: H-Hold, R-Review, W-Witness, RN-Randomly

Chapter-03

Specifications of Electro Pneumatic Wafer Type Butterfly Valves.

1. Technical Specifications

1.1 Butterfly Valve

1	Type	:	Wafer body, normally closed, Eccentric disc, Double offset /triple eccentric design, Pneumatically actuated, operation through solenoid valve
2	End connection	:	Wafer body to be fit between RF flanges as per ANSI B16.5, 150#
3	Design & Manufacturing code	:	BS 5155/API 609
4	Testing code	:	BS 6755/ API 528/API 598
5	Operating Pressure & Temperature	:	12 bar (g), 80 Deg C
6	Design class rating Valve Body Test Pressure rating	:	As per ANSI 150 class / PN 16
7	**ΔP across seat for leak tightness**	:	19.6 bar (g)
8	Allowable Seat leakage	:	Bubble tight shut off (ANSI B 16.104 class VI)/API598
9	**Material of construction**	**:**	
9.1	Body	:	Carbon steel A 216 WCB/CI – Gr.260
9.2	Disc	:	Stainless steel as per A 351 CF 8MSCS13A/SS316
9.3	Stem	:	SS – AISI 410 /SS316/SUS630
9.4	Seat & shaft seal	:	Filled Teflon seats & Teflon shaft seals/PTFE/RPTFE
9.5	Fasteners & Washers	:	SS, A 193 Gr.B8M/A194 Gr. 8M
10	Inspection	:	By Supplier's quality control department & purchaser representative prior to dispatch as per QAP at Supplier's place
11	Service/Fluid Handled	:	Raw Water/ Foam Solution

1.2 Pneumatic Actuator

1	Type	:	Direct coupled, spring return, single acting pneumatic cylinder. Suitable for Nitrogen/Air.
2	Action	:	Nitrogen/Air supply failure to close
3	Max. Operating Pressure	:	8 -10 kg/cm^2
4	Normal Operating pressure	:	5 - 6 kg/cm^2
5	Nitrogen/Air consumption per operation	:	To be specified by vendor.
6	Design Pressure range of the actuator	:	Lower limit & Upper limit - **To be specified by vendor**
7	Max. Operating temp. in ^{o} C	:	80 degrees Celsius
8	Angle Of rotation	:	90 deg. (with provision on the actuator to adjust the angle of rotation
9	Failure position	:	Normally closed
10	Springs	:	As per manufacturer's standard
11	Response time along with valve	:	Tentative time for opening of the valve is given below and supplier has to provide response time of offered/Proposed valves. Required SS tubing from filter regulator, Solenoid valve

			to the speed controller & up to the actuator to be provided with suitable mounting brackets

VALVE SIZE, NB	ON TIME (Sec)		OFF TIME (Sec)	
	Min.	Max.	Min.	Max.
400	4	6	10	12
300	4	6	8	10
250	4	6	8	10
200	4	6	6	8
150	2	4	4	6
100	2	4	4	6

12	**Material of construction**		
12.1	Body	:	Aluminum Alloy
12.2	Inter connecting bracket between valve and actuator	:	CS/Stainless steel (Preferred)
12.3	Fasteners, Tie rods, washers	:	Stainless steel
12.4	Support brackets for accessories listed under C	:	Stainless steel

1.3 Accessories:

I	**Limit switch**	**:**	The specified Micro-switch assemblies housed in flame proof and weather proof enclosure will be mounted on Actuator for monitoring the ON/OFF status of electro pneumatic
a	Make & Model	:	**To be specified by vendor**
b	Type	:	4 x SPDT switch /4 x DPDT switch Explosion proof as per NEMA
c	No. of Indicators	:	Two numbers of OPEN and two numbers of CLOSE (one set redundant) 4 x SPDT switch/4 x DPDT switch
d	Operating Temperature		50 deg. C
e	Enclosure	:	IP – 65 min
f	Voltage / Contact rating	:	24 VDC / 1 Amp. Minimum
g	Body material	:	Aluminum
h	Electrical classification	:	EE xd IIC T6, IP67
i	Mounting	:	Directly on the actuator
j	Electrical conduit	:	$^{3}/_{4}$ "NPT – female threads- with SS plugs.
II	**Filter Regulator**	**:**	Required at inlet side of solenoid valve. (Primary Pressure range: 15-bar max.) Secondary Pressure range: 0-10 bar), 5 microns.

a	Make & Model	:	To be specified by vendor
b	Body material	:	Aluminum / SS
III	**Speed Controller**	:	In built with actuator or externally fitted (Body material: Al/ SS)
a	**Make**	:	**To be specified by vendor**
IV	**Quick exhaust valve**	**:**	Required on Outlet side of actuator (After speed controller)
a	Body material	:	Brass /Al. /SS
b	Make	:	**To be specified by vendor**
c	End connection	:	½" / $^{3}/_{4}$ "NPTF
V	**Intrinsically Safe Direct Operated Dual Redundant Solenoid Valve**		
a	Make & Model	**:**	Norgren Herion / Parker/ equivalent to be specified by vendor meeting the following specifications.
b	Solenoid valve Type	**:**	Intrinsically Safe with Dual Coil & Dual Valve (1 Main + 1 Redundant) Energizing any one or both the coils should operate the pneumatic actuator at the output port. Direct operated for continuous operation. Redundant valve design, High availability design. Safe venting, high availability design with SS tubing SS304/SS316/SS304L/ SS316L. The model no of quoted solenoid valve to be specified by vendor.
VI	**Valve Specifications**		
a	Valve type	**:**	3/2 Way Universal, 1/4" Solenoid valve, Direct acting Poppet type, Intrinsically safe
b	Type of operation	**:**	Normally closed
c	Operating temperature	**:**	-20 to 60 deg C
d	Orifice size .	**:**	≥ 5 mm
e	Operating Pressure & medium	**:**	0 to 10 bar (nominal) of dry GN2/Air (Direct operated)
f	Material of construction	**:**	SS304 / SS316 /S S304L / SS316L with SS internals and SS mounting screws
g	Internal seals	**:**	VITON / NBR (Perbunan) seals
h	Process End connection	**:**	¼" NPT(F) Inlet, Outlet & vent port. Suitable SS silencer/mufflers shall be supplied.
VII	**Solenoid coil specifications**		
a	No. of coils	**:**	Two

b	Type of coil and operation	:	Intrinsically safe and Electromagnetic
c	Operating voltage	:	DC operated suitable to operate with P&F make Intrinsically Safe barrier KCD0-SD3-Ex1.1245 / KCD0-SD3-Ex1.1045. Entity parameters of solenoid coil shall be suitable for the barrier. The solenoid coil in combination with the above mentioned IS barrier shall support a minimum of 500m of 0.5 sq mm cable loop resistance (Considering loop resistance (Out and return) of 80.2Ω / Km at 20°C) in IIC area.
d	Cable entry	:	½" NPT (F) / M20 x 1.5. SS Double compression cable gland shall be provided.
e	Solenoid Enclosure	:	Die Cast/Hard Anodized Aluminium housing and cover with Epoxy (or) Fibre reinforced plastic housing and cover.
f	Coil Insulation Class	:	H
g	Termination	:	Coil with Embedded screw terminals/terminal block
h	Environmental classification	:	IP 66
i	Electrical classification	:	EEx ia IIC T4/T6 valve shall be conforming to ATEX/PTB certified for use in zone I and gas group II C.
j	Approvals	:	ATEX/CCOE approved-PTB certified. SIL-3 or better for independent solenoid coil and valve combination.
VIII	**Mufflers for all vent ports**	:	Required
a	Body material	:	Aluminum/ SS/Brass
IX	**Lifting lugs for handling if required**	:	Suitable lifting lugs for handling the unit.

2. Schedule for Electro Pneumatic Wafer Type Butterfly Valves:

Sl. No.	Description	Units	Qty.
1	100 NB EP BUTTERFLY VAVE, 150#	Nos.	10
2	150 NB EP BUTTERFLY VAVE, 150#	Nos.	3
3	200 NB EP BUTTERFLY VAVE, 150#	Nos.	7
4	300 NB EP BUTTERFLY VAVE, 150#	Nos.	2

3. General conditions for CS EP Butterfly valve:

1. Solenoid valve also in the scope of the supplier.
2. No welding is allowed on the valve body.
3. Valve actuators shall be provided with sintered mufflers on vent side.
4. All fasteners shall be SS304L/SS316L
5. Actuator body should be Extruded Aluminum Alloy Internally Hard anodized.
6. The sectional drawings with material of construction of all parts and QAP (Quality Assurance Plan) shall be sent to purchaser for approval before commencing production. The supplier shall guarantee that the valves supplied shall be exactly as per the approved drawing in all aspects.

7. The supplier shall ensure that QAP is strictly followed in all stages of manufacturing, Testing & Inspection.
8. Inspection of Valves shall be carried out by the Purchaser prior to dispatch at Manufacturers site as per approved QAP.
9. The supplier has to inform the purchaser, the readiness of the materials for inspection well in advance for arranging the purchaser's representative for inspection at works. The items shall be dispatched only after inspection of the valves completed by the purchaser's inspection engineers at works and after dispatch clearance given by the purchaser.
10. Foundry/Material test certificate of all wetted parts of the valves and all other test certificates like body hydro test, leak test, functional test etc., shall be furnished to the purchaser at the time of inspection.
11. Test certificates from appropriate testing and certifying authorities for explosion proof for specified class and protection class of limit switch enclosures shall be obtained and furnished at the time of inspection without which the items cleared during inspection.
12. The valves shall be tagged with size, class rating and material of construction of body, manufacturer's reference no. etc.,
13. All valves shall be painted with high epoxy paint with aliphatic polyurethane final coat and total DFT shall be 150+ 10 µ. Painting shall be carried out after our final inspection.
14. The valves offered shall be guaranteed for proper performance for a period of minimum 18 months form the date of receipt and acceptance.
15. Required SS tubing from Filter regulator to the Solenoid valve, speed Controllers & upto the Actuator to be provided with suitable mounting brackets.
16. Prior to dispatch of the items, Supplier shall forward the below referred documentations in confirmation with approved QAP to the purchaser
    - Data sheets & Drawings of the Valve along with Actuator, Accessories & Pneumatic circuit diagrams
    - Test reports of bought out items like actuators, limit switches and any other components etc.
    - Complete Test documentation as specified in QAP
17. Dispatch clearance will be provided by the purchaser, upon review of the above documents
18. At the time of dispatch of items, 3 sets of production master files comprising the following shall be supplied.
    - Final Inspection / clearance report.
    - Final Datasheets & drawings
    - Test Reports
    - Operational and Maintenance manual
    - Material Test certificates of wetted parts.
    - Part list and spares list
19. **Supply of Spare Kits:** Consisting of Butterfly valve spare kits and Actuator spare kits for below mentioned EP Butterfly valves. Spare kits shall be neatly packed to avoid damage during transit.

Sl. No.	Description	Units	Qty.
1	100 NB EP BUTTERFLY VAVE, 150#	Sets.	2
2	150 NB EP BUTTERFLY VAVE, 150#	Sets.	2
3	200 NB EP BUTTERFLY VAVE, 150#	Sets.	2
4	300 NB EP BUTTERFLY VAVE, 150#	Sets.	2

4. Quality Assurance Plan for Electro Pneumatic Butterfly Valves:

Sl.No	Characteristics / type of check	Ref. Document.	Method of check	Quantum of check	
				Supplier 's Q.C	Purchaser Rep.
1	Raw material identification (Chemical Analysis & Mechanical Testing) per heat / lot	Customer P O/ Approved drwg.	Verification of Material test certificates.	R 100%	R 100%
2	Dimensional and Visual inspection	Customer approved drwg.	Measurement/ visual	R 100%	W (RN) 10%
3	Hydro shell/Body test	BS 6755 Part-I/ EN 12266 Part 1/API 598/	Testing on RIG (Min 1 No per size)	H 100 %	W (RN) 10%
4	Hydro/Pneumatic seat test		Testing on RIG (Min 1 No per size)	H 100 %	W (RN) 10%
5	Functional test with Actuators and limit switches	As per P O/ Approved drwg.	Performance of On/OFF status of valves	H 100%	W (RN) 10%
6	Valve identification tagging/labeling on valve/ protection	Customer P O	Visual	H 100 %	W (RN) 10%
7	Valve coating / painting	Customer P O/ Approved drwgs	Review of paint DFT measurement report	H 100%	R 100%
8	Final Documentation	As per P O/ Approved drwg.	Verification of Documents/ Certificates	H 100%	R 100%

Legend: H-Hold, R-Review, W-Witness, RN-Randomly

Chapter – 04

Specifications for CS Manual Ball Valve

1. Technical Specifications

Item Description	Detailed specification for	
	C.S Socket weld/ Threaded-NPT(Female)type ball valves	**C.S Flanged type ball valves**
Type	Regular Bore, Three piece, Floating Ball valve	Full Bore, Two piece, Floating Ball valve
End connections	Socket weld/Threaded-NPT (Female) Conforming to ANSI 16.11	RF Flanged Conforming to ANSI B 16.5, 150#
Class rating & Quantity	800#	150#
Mode of operation	Hand Lever	Hand Lever
Design & Dimension code	BS 5351/ API 6D/ISO 17292	BS 5351/API 6D/ISO 17292
Antistatic Device	To be provided	To be provided
Blowout proof stem	To be provided	To be provided
Leakage Class	Bubble Tight shut off / Rate-A	Bubble Tight shut off / Rate-A
Testing code	BS 6755 Part-I / API-598/ EN 12266 Part I/ ISO 5208	BS 6755 Part-I / API-598/ EN12266 Part I/ISO 5208
Service/Fluid Handled	Raw Water/ Foam Solution	Raw Water/ Foam Solution
Material of construction:		
Body Material	ASTM A105	A 216 Gr. WCB
Ball Material	CF8M/SS 316	CF8M/SS 316
Seat Material	PTFE	PTFE
Seals	Graphite/ PTFE	Graphite/ PTFE
Gland packing, Seals	PTFE	PTFE
Bolting / Nuts	A 193 Gr. B 7/ A 194 Gr. 2H #	A 193 Gr. B 7/ A 194 Gr. 2H #
Valve Castings	Radiography Quality (If required as per standard)	Radiography Quality (If required as per standard)
Castings/ Forgings	Solution Annealed	Solution Annealed
# All fasteners, studs, nuts, washers, Hand lever etc. shall be **Electro galvanized/ Surface plated for corrosion protection**.		

2. Schedule of CS Manual Ball Valves

Sl. No.	Description	Units	Qty.
1	40NB MANUAL BALL VALVE FLANGED 150#	Nos.	5
2	25NB MANUAL BALL VALVE FLANGED 150#	Nos.	10
3	15NB MANUAL BALLVALVE FLANGED 150#	Nos.	10
4	25NB MANUAL BALL VALVE SOCKET WELDED 800#	Nos.	20
5	15NB MANUAL BALL VALVE SOCKET WELDED 800#	Nos.	20
6	25NB MANUAL BALL VALVE NPT THD 800#	Nos.	25
7	15NB MANUAL BALL VALVE NPT THD 800#	Nos.	45

3. General Conditions for CS Ball Valves:

i No welding shall be attempted on the valve body / parts.

ii The valve offered shall be guaranteed for proper performance for a period of minimum of 18 months form the date of receipt and acceptance.

iii The sectional drawings with material of construction of all parts and QAP (Quality Assurance Plan) shall be sent to purchaser for approval before commencing production. The supplier shall guarantee that the valves supplied shall be exactly as per the approved drawing in all aspects.

iv All castings (valve body) shall be of radiographic quality. All castings shall be of investment casting. For all the valves, radiography test shall be carried out on one sample selected at random for each size and class. Radiography shall be carried out, one sample selected at random for each size and radiography evaluation reports shall be submitted during inspection of valves.

v The supplier shall ensure that QAP is strictly followed in all stages of manufacturing, Testing & Inspection.

vi Inspection of Valves shall be carried out by the Purchaser prior to dispatch at Manufacturers site as per approved QAP.

vii The supplier has to inform the purchaser, the readiness of the materials for inspection well in advance for arranging the purchaser's representative for inspection at works. The items shall be dispatched only after inspection of the valves completed by the purchaser's inspection engineers at works and after dispatch clearance given by the purchaser.

viii Prior to dispatch of the items, Supplier shall forward the below referred documentations in confirmation with approved QAP to the purchaser

- Data sheets & Drawings of the Valve along with Actuator, Accessories & Pneumatic circuit diagrams
- Test reports of bought out items like actuators, limit switches and any other components etc.
- Complete Test documentation as specified in QAP

ix Dispatch clearance will be provided by the purchaser, upon review of the above documents

x At the time of dispatch of items, 3 sets of production master files comprising the following shall be supplied.

- Final Inspection / clearance report.
- Final Datasheets & drawings
- Test Reports
- Operational and Maintenance manual
- Material Test certificates of wetted parts.
- Part list and spares list

xi The valves shall be punched with details like, size, class rating, material of construction etc.

xii All castings shall be solution annealed to ASTM A 351 S11.1.

xiii All flanged faces shall be Raise Face (RF), serrated.

xiv Ball shall be of solid construction for all sizes. Hollow Ball construction is not acceptable.

xv All valves shall be painted with high epoxy paint with aliphatic polyurethane final coat and total DFT shall be 150+/- 10µ. Painting shall be carried out after our final inspection.

xvi **Supply of Spare kits**: Consisting of Seats, Seals, O-rings, Gland packing seals etc., for below CS Manual Ball valves. Spare kits shall be neatly packed to avoid damage during transit.

Sl. No.	Description	Units	Qty.
1	40NB MANUAL BALL VALVE FLANGED 150#	Sets.	2
2	25NB MANUAL BALL VALVE FLANGED 150#	Sets.	2
3	15NB MANUAL BALLVALVE FLANGED 150#	Sets.	2
4	25NB MANUAL BALL VALVE SOCKET WELDED 800#	Sets.	4
5	15NB MANUAL BALL VALVE SOCKET WELDED 800#	Sets.	4
6	25NB MANUAL BALL VALVE NPT THD 800#	Sets.	4
7	15NB MANUAL BALL VALVE NPT THD 800#	Sets.	5

4. Quality Assurance Plan for CS Manual Ball Valves

Sl.No	Characteristics / type of check	Ref. Document.	Method of check	Quantum of check	
				Supplier's Q.C	Purchaser's Inspector
1	Chemical Analysis of Body, Bonnet, Ball & Stem per heat / lot	Customer P O/ Approved drgs.	Verification of Material test certificates	R 100%	R 100%
2	Mechanical Testing (Yield, Tensile & Elongation) of Body, Bonnet, Ball & Stem per heat / lot	Customer P O/ Approved drgs.	Verification of Material test certificates	R 100%	R 100%
3	Solution Annealing per heat / lot	Customer P O/ Approved drgs	Verification of MTCs/Heat charts	R 100%	R 100%
4	Radiography on critical areas	ASME B.16.34.	Review of radiographs	R 100%	R 100 %
5	Dimensional and visual inspection	Customer Approved drgs.	Measurement/ visual	R 100%	W (RN) 10%
6	Valve assembly	Customer P O/ Approved drwg.	Bill of material /visual	H 100%	R 10%
7	Hydro Shell / body test	BS 6755 Part - l/API 598/ EN 12266 Part-l/ ISO 5208	Testing on RIG (Min 1 No per size)	H 100%	W (RN) 10%
8	Hydro / Pneumatic seat test		Testing on RIG (Min 1 No per size)	H 100%	W (RN) 10%
9	Valve identification Tagging/labeling on valve/Protection	Customer P O	Visual	H 100%	W (RN) 10%
10	Valve coating /painting	Customer P O / Approved drgs	Review of paint DFT measurement report	H 100%	R 100%
11	Final documentation	AS per PO Approved drwg	Verification of Documents/ Certificates	H 100%	R 100%

Legend: H-Hold, R-Review, W-Witness, RN-Randomly

Chapter – 05

Specifications for Manual Butterfly Valves (Wafer)

1. Technical specifications:

Mode of operation:

- Hand lever operated for valves up to 150NB
- Wheel with horizontal worm gear for valves above 150NB.

1	Design, manufacture	:	BS 5155/AP1 609/BS EN 593
2	Testing code	:	BS 6755 part I/ EN 12266 PART 1 & 2
3	Type	:	Wafer design, Integral seat, Bubble tight shut off
4	Design class rating	:	PN 16
5	End connection	:	Wafer design suitable for ANSI B 16.5 flanges, 150#
6	Operating pressure	:	12 bar
7	Maximum operating pressure for testing of Valves	:	As per PN 16 class rating
8	Service/Fluid handled	:	Raw Water/ Foam Solution
9	**Material of construction**		
9.1	Body	:	CI to IS 210 Gr 260 / Carbon steel A 216 WCB
9.2	Disc	:	ASTM A 351 Gr. CF8, Forged quality SS304
9.3	Shaft	:	SS 410 XYLAN Coated
9.4	Seat	:	Black nitrile
9.5	Hand Lever	:	CI/SS/CS(Galvanized)
9.6	Handwheel	:	CI/SS/CS(Galvanized)
9.7	Worm Gear	:	CI Housing & Gun Metal Worm wheel
9.8	Name plate Tag	:	SS, Min. 1.5 mm thick to be riveted on body
10	Locking provision for handle/ Wheel	:	To be provided for fully open & fully closed position of valve.

2. Schedule of Manual Butterfly Valves

Sl.No	DESCRIPTION	Units	Qty.
1	200 NB MANUAL BUTTERFLY VALVE	Nos	16
2	150 NB MANUAL BUTTERFLY VALVE	Nos	08
3	100 NB MANUAL BUTTERFLY VALVE	Nos	12
4	80 NB MANUAL BUTTERFLY VALVE	Nos	10
5	50 NB MANUAL BUTTERFLY VALVE	Nos	10

3. General conditions:

i. The sectional drawings with material of construction of all parts and QAP (Quality Assurance Plan) shall be sent to purchaser for approval before commencing production. The supplier shall guarantee that the valves supplied shall be exactly as per the approved drawing in all aspects.

ii. The valve offered shall be guaranteed for proper performance for a period of minimum of 18 months form the date of receipt and acceptance.

iii. The supplier shall ensure that QAP is strictly followed in all stages of manufacturing, Testing & Inspection.
iv. Inspection of Valves shall be carried out by the Purchaser prior to dispatch at Manufacturers site as per approved QAP.
v. The supplier has to inform the purchaser, the readiness of the materials for inspection well in advance for arranging the purchaser's representative for inspection at works. The items shall be dispatched only after inspection of the valves completed by the purchaser's inspection engineers at works and after dispatch clearance given by the purchaser.
vi. Prior to dispatch of the items, Supplier shall forward the below referred documentations in confirmation with approved QAP to the purchaser
    - Data sheets & Drawings of the Valve along with Actuator, Accessories & Pneumatic circuit diagrams
    - Test reports of bought out items like actuators, limit switches and any other components etc.
    - Complete Test documentation as specified in QAP
vii. Dispatch clearance will be provided by the purchaser, upon review of the above documents
viii. At the time of dispatch of items, 3 sets of production master files comprising the following shall be supplied.
    - Final Inspection / clearance report.
    - Final Datasheets & drawings
    - Test Reports
    - Operational and Maintenance manual
    - Material Test certificates of wetted parts.
    - Part list and spares list
ix. Dimensional drawing indicating parts and their material of construction including shall be sent for approval after receipt of order.
x. The scope of inspection as per BS 6755 Part I/ EN 12266 PART 1
    a. Dimensional verification.
    b. Witness of shell & seat hydro test.
xi. **Painting:** Outer surface of the valve body, Gear unit & wheel shall be painted with high built epoxy paint (Primer: Minimum 60 Microns and Finish coat: Minimum 40Microns) **Total DFT of paint shall be 100 to 120 Microns**. Paint Shade: Azure blue
xii. SS Tag numbering plates of Size 50mm x15mmx 1.5mm thick shall be riveted on valve body at a prominent location.
xvii **Spares:** Supply includes spare Gear Units: 2 Sets for each size. Spare kits shall be neatly packed to avoid damage during transit.

Sl.No	DESCRIPTION	Units	Qty.
1	200 NB MANUAL BUTTERFLY VALVE	Nos	2
2	150 NB MANUAL BUTTERFLY VALVE	Nos	2

4. Quality Assurance Plan for Manual Butterfly Valves:

Sl.No	Characteristics / type of check	Ref. Document.	Method of check	Quantum of check	
				Supplier 's Q.C	Purchaser Rep.
1	Raw material identification (Chemical Analysis & Mechanical Testing) per heat / lot	Customer P O/ Approved drwg.	Verification of Material test certificates.	R 100%	R 100%
2	Dimensional and Visual inspection	Customer approved drwg.	Measurement/ visual	R 100%	W (RN) 10%
3	Hydro shell/Body test	BS 6755 Part-I/ EN 12266 Part 1/API 598	Testing on RIG (Min 1 No per size)	H 100 %	W (RN) 10%
4	Hydro/Pneumatic seat test		Testing on RIG (Min 1 No per size)	H 100 %	W (RN) 10%
5	Valve identification tagging/labeling on valve/ protection	Customer P O	Visual	H 100 %	W (RN) 10%
6	Valve coating / painting	Customer P O/ Approved drwgs	Review of paint DFT measurement report	H 100%	R 100%
7	Final Documentation	As per P O/ Approved drwg.	Verification of Documents/ Certificates	H 100%	R 100%

SECTION-B
FORMATS TO BE SUBMITTED BY SUPPLIER

Checklist for SS Socket weld/Threaded type Manual Ball Valve **Format- 1**

S.No	Item Description	Detailed Specification for S.S Socket weld/Threaded- NPT(Female)type ball valves	Compliance Yes/No
1	Type	Regular Bore (Full bore/port), Three piece Floating Ball valve	
2	End connections	Socket Weld (SW)/Threaded (NPT-Female) Conforming to ANSI B16.11	
3	Class rating	800#	
4	Face to face dimensions	As per BS 5351/ANSI B16.10/ANSI B16.34/	
5	Mode of operation	Hand Lever	
6	Design code	BS 5351/ISO 17292	
7	Antistatic Device	To be provided	
8	Blowout proof stem	To be provided	
9	Fire safe	-	
10	Leakage Class	As per ANSI B16.104 Class VI/ FCI 70.2 -100% Bubble Tight shut off/ Zero Leak /Rate-A	
11	Testing code	BS 6755 Part -l/API 598/EN 12266 Part-l/ISO 5208	
12	Service/Fluid handled	AFFF 3% (Aqueous Film Forming Foam concentrate)	
	Material of Construction		
13	Body and Ball Material	CF8M / SS316L	
14	Seat Material	PTFE /RPTFE	
15	Stem , Stem bush, Stem nuts, Spacer Material	SS 316	
16	Lever material	SS304	
17	Body seal/Gasket	Graphite/PTFE/RPTFE	
18	Stem seal: Stem packing/0-ring	Graphite/PTFE/RPTFE	
19	Bolting / Nuts	A 193 Gr. B8M/A 194 Gr 8M	
20	Valve Castings	Radiography Quality (If required as per standard)	
21	Castings/ Forgings	Solution Annealed	
22	Cost of spare kits also included against cost of respective valves mentioned in Table-1 Schedule of Quantities.		
23	Acceptance of General conditions for SS Socket weld/Threaded type Ball valves as per Chapter-01		
24	Acceptance of QAP for SS Socket weld/Threaded type Ball valves as per Chapter-01		

Checklist for SS Flanged type Manual Ball Valve: **Format-2**

S. No	Item Description	Detailed Specification for S.S Flanged type ball valves	Compliance Yes/No
1	Type	Full bore, One/ Two piece Floating Ball valve	
2	End connections	RF Flanged confirming to ANSI B16.5, 150#	
3	Class rating	150#	
4	Face to face dimensions	As per ANSI B 16.10	
5	Mode of operation	Hand Lever	
6	Design code	BS5351/ISO 17292	
7	Antistatic Device	To be provided	
8	Blowout proof stem	To be provided	
9	Fire safe	BS 6755 Part – II/API 607/ EN 12266 Part-II	
10	Leakage Class	As per ANSI B16.104 Class VI/ FCI70.2 - 100% Bubble Tight shut off/Zero leak /Rate-A	
11	Testing code	BS 6755 Part -l/API 598/EN 12266 Part-l/ISO 5208	
12	Service/Fluid handled	AFFF 3% (Aqueous Film Forming Foam concentrate)	
	Material of Construction		
13	Body and Ball Material	CF8M / SS316	
14	Seat Material	PTFE /RPTFE	
15	Stem , Stem bush, Stem nuts, Spacer Material	SS 316	
16	Lever material	SS304	
17	Body seal/Gasket	Graphite/PTFE/RPTFE	
18	Stem seal: Stem packing/0-ring	Graphite/PTFE/RPTFE	
19	Bolting / Nuts	A 193 Gr. B8M/A 194 Gr 8M	
20	Valve Castings	Radiography Quality (If required as per standard)	
21	Castings/ Forgings	Solution Annealed	
22	Cost of spare kits also included against cost of respective valves mentioned in Table-1 Schedule of Quantities.		
23	Acceptance of General conditions for SS Flanged type Ball valves as per Chapter-01		
24	Acceptance of QAP for SS Flanged type Ball valves as per Chapter-01		

Checklist for SS EP Ball Valves **Format-3**

I.	**Valve**		
Sl.No	**Description**	**Remarks**	**Compliance Yes/No**
1	End Connection	RF Flanged with serration to ANSI B 16.5	
2	Port	Full Bore	
3	Construction	2 pieces	
4	Operating Temperature	50 ^{0}C	
5	Service/Fluid handled	AFFF 3% (Aqueous Film Forming Foam concentrate)	
6	Design Code	BS 5351/ ISO 17292	
7	Testing Code	BS 6755 Part-I/ EN 12266 Part 1/API 598/ ISO 5208	
8	Anti-static Device	Yes, to be provided	
9	Operation	By direct mounted pneumatic actuator	
10	Fire Safe Design	BS6755 Part - 2/ API-607 / EN 12266 Part-II	
II.	**Material of construction of valve**		
Sl.No	**Description**	**Remarks**	**Compliance Yes/No**
1	Body	SS 316	
2	Stem	SS 316	
3	Gland	SS 316	
4	Ball	SS 316 (Solid bar) or CF8M Cast one	
5	Seat	PTFE	
6	Gland packing seals	PTFE/Graphite	
7	Body seals	PTFE/Graphite	
8	Bolting	A 193 Gr. B8M/A194 Gr. 8M	
9	Heat treatment	Solution annealing for all castings as per standard ASTM A 351	
10	Inspection	By Supplier's Quality Control Department & Purchaser's representative prior to dispatch as per QAP at Manufacturer's Place	
III.	**Actuators**		
Sl.No	**Description**	**Remarks**	**Compliance Yes/No**
1	Type	Spring return, single acting piston & Direct Mounted as per ISO STD. Links shall be of Stainless Steel.	
2	Input signal	Min 5 bar (g) of N_2 gas/Air nominal 7 bar (g)	
3	Angle of rotation	90Deg (with a provision on the actuator to adjust the angle of rotation)	
4	Response time along with valve	Min 2 – 4 seconds (for opening) Min 4 – 6 seconds (for closing)	
5	Failure position	Normally closed	
6	Body material	Extruded Aluminum Alloy Internally Hard anodized, externally coated with Polyurethane/ Epoxy powder	

7	Piston & Rack	Anodized die cast Aluminum	
8	Air supply connections	¼"BSPP, Female	
9	Springs	Cartridge type multi springs of material spring Steel, Electro Static	
10	Optimum torque should be selected for each size of valve actuator. For interpolated torque values, next higher value should be chosen. However torque values shall be detailed in the offer.		
IV.	**Limit Switches**		
Sl.No	**Description**	**Remarks**	**Compliance Yes/No**
1	The specified Micro-Switch assemblies housed in Flame proof and weatherproof enclosure will be mounted on Actuator for monitoring the ON/OFF status of Electro Pneumatic Valves.		
2	Type	Heavy Duty, SPDT Switches	
3	No. of switches for each valve	4 nos. (2 Nos. for ON and 2 nos. for OFF Status)	
4	Contacting Rating	As per standard	
5	Operating Temperature	50 Deg.C	
V.	**Limit Switch Enclosure :**		
Sl.No	**Description**	**Remarks**	**Compliance Yes/No**
1	Material of Construction	Aluminum Alloy	
2	Degree of protection	IP 65 or better	
3	Electrical Classification	Flame proof suitable for Zone 0/1 Group II C environment certified by BASEEFA or equivalent International Agency/ IS 2148 Gr. II C.	
4	Cable Entry	¾" NPT (female) 2 nos. (1 no. to be plugged) One no. of ¾"NPT suitable double compression gland (GR-IIC) shall be supplied with each enclosure	
5	Local ON/OFF indication	Impact Resistant Thermoplastic (Preferable). To be mounted on Micro-Switch assembly	
6	Mounting Accessories	All fittings, connectors, screws, Circlips etc. shall be of SS 304 /316 only & the scope includes the supply of coupling and mounting bracket links also	
7	Cams for switches	Individual cam with adjustment Provision for each Micro-Switch to be provided	
8	Interface brackets and couplings, Bolts, circlips etc. shall be of SS 304/316 only.		
VI.	**Intrinsically Safe Direct Operated Dual Redundant Solenoid Valve**		
1	Make & Model	Norgren Herion / Parker/ equivalent to be specified by vendor meeting the following specifications.	
2	Solenoid valve Type	Intrinsically Safe with Dual Coil & Dual Valve (1 Main + 1 Redundant) Energizing	

		any one or both the coils should operate the pneumatic actuator at the output port. Direct operated for continuous operation. Redundant valve design, High availability design. Safe venting, high availability design with SS tubing SS304/SS316/SS304L/ SS316L. The model no of quoted solenoid valve to be specified by vendor.	
3	**Valve Specifications**		
a	Valve type	3/2 Way Universal, 1/4" Solenoid valve, Direct acting Poppet type, Intrinsically safe	
b	Type of operation	Normally closed	
c	Operating temperature	-20 to 60 deg C	
d	Orifice size .	≥ 5 mm	
e	Operating Pressure & medium	0 to 10 bar (nominal) of dry GN2/Air (Direct operated)	
f	Material of construction	SS304 / SS316 /S S304L / SS316L with SS internals and SS mounting screws	
g	Internal seals	VITON / NBR (Perbunan) seals	
h	Process End connection	¼" NPT(F) Inlet, Outlet & vent port. Suitable SS silencer/mufflers shall be supplied.	
4	**Solenoid coil specifications**		
a	No. of coils	Two	
b	Type of coil and operation	Intrinsically safe and Electromagnetic	
c	Operating voltage	DC operated suitable to operate with P&F make Intrinsically Safe barrier KCD0-SD3-Ex1.1245 / KCD0-SD3-Ex1.1045. Entity parameters of solenoid coil shall be suitable for the barrier. The solenoid coil in combination with the above mentioned IS barrier shall support a minimum of 500m of 0.5 sq mm cable loop resistance (Considering loop resistance (Out and return) of 80.2Ω / Km at 20^{o}C) in IIC area.	
d	Cable entry	½" NPT (F) / M20 x 1.5. SS Double compression cable gland shall be provided.	
e	Solenoid Enclosure	Die Cast/Hard Anodized Aluminium housing and cover with Epoxy (or) Fibre reinforced plastic housing and cover.	
f	Coil Insulation Class	H	
g	Termination	Coil with Embedded screw terminals/terminal block	
h	Environmental classification	IP 66	
i	Electrical classification	EEx ia IIC T4/T6 valve shall be conforming to ATEX/PTB certified for use in zone I and gas group II C.	

j	Approvals	ATEX/CCOE approved-PTB certified. SIL-3 or better for independent solenoid coil and valve combination.	
5	Acceptance of General conditions for SS EP Ball valves as per Chapter-02		
6	Acceptance of QAP for SS EP Ball valves as per Chapter-02		

Checklist for Carbon Steel EP Butterfly Valve **Format-4**

Sl.No	Description	Remarks	Compliance Yes/No
I.	**Valve**		
1	Type	Wafer body, normally closed, Eccentric disc, Double offset /triple eccentric design, Pneumatically actuated, operation through solenoid valve	
2	End connection	Wafer body to be fit between RF flanges as per ANSI B16.5, 150#	
3	Design & Manufacturing code	BS 5155/API 609	
4	Testing code	BS 6755/ API 528/API 598	
5	Operating Pressure & Temperature	12 bar (g), 80 Deg C	
6	Design class rating Valve Body Test Pressure rating	As per ANSI 150 class / PN 16	
7	ΔP across seat for leak tightness	19.6 bar (g)	
8	Allowable Seat leakage	Bubble tight shut off (ANSI B 16.104 class VI)/API598	
9	Material of construction		
9.1	Body	Carbon steel A 216 WCB/CI – Gr.260	
9.2	Disc	Stainless steel as per A 351 CF 8MSCS13A/SS316	
9.3	Stem	SS – AISI 410 /SS316/SUS630	
9.4	Seat & shaft seal	Filled Teflon seats & Teflon shaft seals/PTFE/RPTFE	
9.5	Fasteners & Washers	SS, A 193 Gr.B8M/A194 Gr. 8M	
10	Inspection	By Supplier's quality control department & purchaser representative prior to dispatch as per QAP at Supplier's place	
11	Service/Fluid Handled	Raw Water/ Foam Solution	
II.	**Pneumatic Actuator**		
1	Type	Direct coupled, spring return, single acting pneumatic cylinder. Suitable for Nitrogen/Air.	
2	Action	Nitrogen/Air supply failure to close	
3	Max. Operating Pressure	8 -10 kg/cm^2	
4	Normal Operating pressure	5 - 6 kg/cm^2	
5	Nitrogen/Air consumption per operation	To be specified by vendor.	
6	Design Pressure range of the actuator	Lower limit & Upper limit - **To be specified by vendor**	
7	Max. Operating temp. in ^{o} C	80 degrees Celsius	
8	Angle Of rotation	90 deg. (with provision on the actuator to adjust the angle of rotation	
9	Failure position	Normally closed	
10	Springs	As per manufacturer's standard	

Sl.No	Description	Remarks	Compliance Yes/No
11	Response time along with valve	Tentative time for opening of the valve is given in Chapter 03 and supplier has to provide response time of offered/ Proposed valves. Required SS tubing from filter regulator, Solenoid valve to the speed controller & up to the actuator to be provided with suitable mounting brackets	
12	**Material of construction**		
12.1	Body	Aluminum Alloy	
12.2	Inter connecting bracket between valve and actuator	CS/Stainless steel (Preferred)	
12.3	Fasteners, Tie rods, washers	Stainless steel	
12.4	Support brackets for accessories listed under C	Stainless steel	
III.	**Accessories**		
III.A.	**Limit switch**	The specified Micro-switch assemblies housed in flame proof and weather proof enclosure will be mounted on Actuator for monitoring the ON/OFF status of electro pneumatic	
a	Make & Model	To be specified by vendor	
b	Type	4 x SPDT switch /4 x DPDT switch Explosion proof as per NEMA	
c	No. of Indicators	Two numbers of OPEN and two numbers of CLOSE (one set redundant) 4 x SPDT switch/4 x DPDT switch	
d	Operating Temperature	50 deg. C	
e	Enclosure	IP – 65 min	
f	Voltage / Contact rating	24 VDC / 1 Amp. Minimum	
g	Body material	Aluminum	
h	Electrical classification	EE xd IIC T6, IP67	
i	Mounting	Directly on the actuator	
j	Electrical conduit	$^{3}/_{4}$ "NPT – female threads- with SS plugs.	
III.B. Filter Regulator			
1	Filter Regulator	Required at inlet side of solenoid valve. (Primary Pressure range: 15-bar max.)Secondary Pressure range: 0-10 bar), 5 microns.	
a	Make & Model	To be specified by vendor	
b	Body material	Aluminum / SS	
III.C. Speed Controller			
1	Speed Controller	In built with actuator or externally fitted (Body material: Al/ SS)	
2	Make	To be specified by vendor	
III.D. Quick exhaust valve			
1	Quick exhaust valve	Required on Outlet side of actuator (After speed controller)	

Sl.No	Description	Remarks	Compliance Yes/No
2	Body material	Brass /Al. /SS	
3	Make	To be specified by vendor	
4	End connection	½" / ¾ " NPTF	
III.E.	**Intrinsically Safe Direct Operated Dual Redundant Solenoid Valve**		
a	Make & Model	Norgren Herion / Parker/ equivalent to be specified by vendor meeting the following specifications.	
b	Solenoid valve Type	Intrinsically Safe with Dual Coil & Dual Valve (1 Main + 1 Redundant) Energizing any one or both the coils should operate the pneumatic actuator at the output port. Direct operated for continuous operation. Redundant valve design, High availability design. Safe venting, high availability design with SS tubing SS304/SS316/SS304L/ SS316L. The model no of quoted solenoid valve to be specified by vendor.	
III.F.	**Valve Specifications**		
a	Valve type	3/2 Way Universal, 1/4" Solenoid valve, Direct acting Poppet type, Intrinsically safe	
b	Type of operation	Normally closed	
c	Operating temperature	-20 to 60 deg C	
d	Orifice size .	≥ 5 mm	
e	Operating Pressure & medium	0 to 10 bar (nominal) of dry GN2/Air (Direct operated)	
f	Material of construction	SS304 / SS316 /S S304L / SS316L with SS internals and SS mounting screws	
g	Internal seals	VITON / NBR (Perbunan) seals	
h	Process End connection	¼" NPT(F) Inlet, Outlet & vent port. Suitable SS silencer/mufflers shall be supplied.	
III.G.	**Solenoid coil specifications**		
A	No. of coils	Two	
B	Type of coil and operation	Intrinsically safe and Electromagnetic	
C	Operating voltage	DC operated suitable to operate with P&F make Intrinsically Safe barrier KCD0-SD3-Ex1.1245 / KCD0-SD3-Ex1.1045. Entity parameters of solenoid coil shall be suitable for the barrier. The solenoid coil in combination with the above mentioned IS barrier shall support a minimum of 500m of 0.5 sq mm cable loop resistance (Considering loop resistance (Out and return) of 80.2Ω / Km at 20^{o}C) in IIC area.	

Sl.No	Description	Remarks	Compliance Yes/No
D	Cable entry	½" NPT (F) / M20 x 1.5. SS Double compression cable gland shall be provided.	
E	Solenoid Enclosure	Die Cast/Hard Anodized Aluminium housing and cover with Epoxy (or) Fibre reinforced plastic housing and cover.	
F	Coil Insulation Class	H	
G	Termination	Coil with Embedded screw terminals/terminal block	
H	Environmental classification	IP 66	
I	Electrical classification	EEx ia IIC T4/T6 valve shall be conforming to ATEX/PTB certified for use in zone I and gas group II C.	
J	Approvals	ATEX/CCOE approved-PTB certified. SIL-3 or better for independent solenoid coil and valve combination.	
III.H.Mufflers for all vent ports		Required	
A	Body material	Aluminum/ SS/Brass	
III.I. Lifting lugs for handling			
1	Lifting lugs for handling	Suitable lifting lugs for handling the unit.	
IV	Acceptance of General conditions for CS EP Butterfly valves as per Chapter-03		
V	Acceptance of QAP for CS EP Butterfly valves as per Chapter-03		

Checklist for C.S Socket weld/ Threaded-NPT(Female)type Ball valves Format-5

S. No	Item Description	Detailed specification for	
		C.S Socket weld/ Threaded-NPT(Female)type ball valves	**Compliance Yes/No**
1	Type	Regular Bore, Three piece, Ball valve	
2	End connections	Socket weld/Threaded-NPT (Female) Conforming to ANSI 16.11	
3	Class rating & Quantity	800#	
4	Mode of operation	Hand Lever	
5	Design & Dimension code	BS 5351/ API 6D/ISO 17292	
6	Antistatic Device	To be provided	
7	Blowout proof stem	To be provided	
8	Leakage Class	Bubble Tight shut off / Rate-A	
9	Testing code	BS 6755 Part-I / API-598/ EN 12266 Part I/ ISO 5208	
10	Service/Fluid Handled	Raw Water/ Foam Solution	
	Material of Construction		
11	Body Material	ASTM A105	
12	Ball Material	CF8M/SS 316	
13	Seat Material	PTFE	
14	Seals	Graphite/ PTFE	
15	Gland packing, Seals	PTFE	
16	Bolting / Nuts	A 193 Gr. B 7 / A 194 Gr. 2H #	
17	Valve Castings	Radiography Quality (If required as per standard)	
18	Castings/ Forgings	Solution Annealed	
19	All fasteners, studs, nuts, washers, Hand lever etc. shall be Electro galvanized/ Surface plated for corrosion protection.		
20	Acceptance of General conditions for CS Socket weld/ Threaded-NPT(Female)type Ball valves as per Chapter-04		
21	Acceptance of QAP for CS Socket weld/ Threaded-NPT(Female)type Ball valves as per Chapter-04		

Checklist for C.S Flanged Type Ball valves **Format-6**

S. No.	Item Description	Detailed specification for	
		C.S Flanged type ball valves	Compliance Yes/No
1	Type	Full Bore, Two piece, Ball valve	
2	End connections	RF Flanged Conforming to ANSI B 16.5, 150#	
3	Class rating & Quantity	150#	
4	Mode of operation	Hand Lever	
5	Design & Dimension code	BS 5351/API 6D/ISO 17292	
6	Antistatic Device	To be provided	
7	Blowout proof stem	To be provided	
8	Leakage Class	Bubble Tight shut off / Rate-A	
9	Testing code	BS 6755 Part-I / API-598/ EN12266 Part I/ISO 5208	
10	Service/Fluid Handled	Raw Water/ Foam Solution	
	Material of construction:		
11	Body Material	A 216 Gr. WCB	
12	Ball Material	CF8M/SS 316	
13	Seat Material	PTFE	
14	Seals	Graphite/ PTFE	
15	Gland packing, Seals	PTFE	
16	Bolting / Nuts	A 193 Gr. B 7/ A 194 Gr. 2H #	
17	Valve Castings	Radiography Quality (If required as per standard)	
18	Castings/ Forgings	Solution Annealed	
19	All fasteners, studs, nuts, washers, Hand lever etc. shall be Electro galvanized/ Surface plated for corrosion protection.		
20	Acceptance of General conditions for CS Flanged type Ball valves as per Chapter-04		
21	Acceptance of QAP for CS Flanged type Ball valves as per Chapter-04		

Checklist for Manual wafer type Butterfly valves **Format-7**

S. No.	Item Description	Detailed specification for	
		Manual butterfly valves (Wafer)	**Compliance Yes/No**
1	Design, manufacture	BS 5155/AP1 609/BS EN 593	
2	Testing code	BS 6755 part I/ EN 12266 PART 1 & 2	
3	Type	Wafer design, Integral seat, Bubble tight shut off	
4	Design class rating	PN 16	
5	End connection	Wafer design suitable for ANSI B 16.5 flanges, 150#	
6	Operating pressure	12 bar	
7	Maximum operating pressure for testing of Valves	As per PN 16 class rating	
8	Service/Fluid handled	Raw Water/ Foam Solution	
9	**Material of construction**		
9.1	Body	CI to IS 210 Gr 260 / Carbon steel A 216 WCB	
9.2	Disc	ASTM A 351 Gr. CF8, Forged quality SS304	
9.3	Shaft	SS 410 XYLAN Coated	
9.4	Seat	Black nitrile	
9.5	Hand Lever	CI/SS/CS(Galvanized)	
9.6	Handwheel	CI/SS/CS(Galvanized)	
9.7	Worm Gear	CI Housing & Gun Metal Worm wheel	
9.8	Name plate Tag	SS, Min. 1.5 mm thick to be riveted on body	
10	Locking provision for handle/ Wheel	To be provided for fully open & fully closed position of valve.	
11	Acceptance of QAP for Manual wafer type Butterfly valves as per Chapter-05		
12	Acceptance of QAP for Manual wafer type Butterfly valves as per Chapter-05		

Checklist to be filled and submitted by the supplier **Format-8**

The supplier shall confirm the following points. With regard to agreement on the scope of supply defined in the specifications without which the order will not be considered.

Sl. No.	Description	Confirmation / Remarks	Deviations, If any
I	Supply of Valves for Foam system at ASLP facilities as per the specifications **Section-A to Section-B and Schedule of quantities, Table - 1**		
II	**SECTION – A**		
	TERMS AND CONDITIONS FOR BID		
1	Confirm Cost of bidding clause is understood as per S.No.1 of Section-A and accepted.		
2	Confirm Taxes clause is understood as per S.No.2.1 of Section-A and accepted.		
3	Confirm Delivery period clause is understood as per S.No.2.2 of Section-A and accepted.		
4	Confirm Payment terms clause is understood as per S.No.2.3 of Section-A and accepted.		
5	Confirm Liquidated Penalty clause is understood as per S.No.2.4 of Section-A and accepted.		
6	Confirm Warranty clause is understood as per S.No.2.5 of Section-A and accepted.		
7	Confirm Performance bank guarantee clause is understood as per S.No.2.6 of Section-A and accepted.		
8	Confirm Security deposit clause is understood as per S.No.2.7 of Section-A and accepted.		
9	Confirm Validity of offer clause is understood as per S.No.2.8 of Section-A and accepted.		
10	Confirm Make in India clause is understood as per S.No.2.9 of Section-A and accepted.		
11	Confirm Ambiguity clause is understood as per S.No.3 of Section-A and accepted.		
12	Confirm Force majeure clause is understood as per S.No.4 of Section-A and accepted.		
13	Confirm Arbitration clause is understood as per S.No.5 of Section-A and accepted.		
14	Confirm Secrecy clause is understood as per S.No.6 of Section-A and accepted.		
15	Confirm Confidentiality and proprietary right protection clause is understood as per S.No.7 of Section-A and accepted.		
16	Confirm Exclusion of Tenders clause is understood as per S.No.8 of Section-A and accepted.		
17	Confirm Instruction to bidder clause is understood as per S.No.9 of Section-A and accepted.		
	TECHNICAL SPECIFICATIONS FOR SUPPLY OF VALVES		
1	Acceptance of Specifications for SS Manual Ball Valves as per the specifications in Chapter-01		
2	Acceptance of Specifications for SS Electro Pneumatic Ball Valves as per the specifications in Chapter-02		

3	Acceptance of Specifications for Electro-Pneumatic Wafer Butterfly Valves as per the specifications in Chapter-03		
4	Acceptance of Specifications for CS Manual Ball Valve as per the specifications in Chapter-04		
5	Acceptance of Specifications for CS Manual Butterfly Valve (Wafer) as per the specifications in Chapter-05		
III	**SECTION-B FORMATS TO BE SUBMITTED BY SUPPLIER**		
15	Formats to be filled and submitted by the supplier as per the Section-B 1. Format-8 Checklist to be filled and submitted by the supplier 2. Format-9 to be filled signed and shall be uploaded by the supplier in techno-commercial bid 3. Format-10 Bid Evaluation Criteria 4. Format-11 Minimum Qualification Criteria Format 5. Format-12 Price bid format.		

Format-9: To be filled signed and shall be uploaded by the supplier in techno-commercial bid:

Sl.No.	Description	Yes / No
1	The Scope of Supply is fully understood by the supplier	
2	Confirm all the specifications and terms & conditions are acceptable	
3	Confirm the specification of supply can be met by the supplier, if any deviation, the same shall be highlighted	
4	Confirm the supply of items are fully quoted as per Table-1, if any of supply portion cannot supplied it should be mentioned clearly.	
5	The individual item wise cost shall be quoted as per the Price bid format	
6	The details like taxes are considered or not	
7	Confirmation for General terms & conditions as per Section-A	
8	The mobilization charges for supply item are considered and they are included in the basic cost.	
9	Cost of spare kits supply is included in the unit rate for SS Ball valves as per the specifications in Chapter-01	
10	Supplier shall give confirmation for acceptance of part order.	
11	Bidder Qualification Criteria and Evaluation criteria formats duly filled and signed.	

Bidder Minimum Qualification Criteria **Format-10**

The following are the minimum essential criteria to further validate/accept the bid. Vendor is requested to provide all the necessary supporting documents. If any deviation/non-compliances/lack of supporting document bid shall be summarily rejected.

Sl. No	Description	Vendor Compliance With Supporting Documents
1	The Bidder should be Society/Firm registered in India since last 3 (Three) years or more as on 31.03.2024. Company Profile along with documentary evidence of services offered and all relevant enclosures to be submitted.	
2	Party should have executed a contract involving supply of valves for a value not less than Rs. 1.0 Crores (in the last five years) as a single order (or) atleast two orders of worth Rs. 75 lakhs each (or) atleast three orders of worth Rs. 50 lakhs each.	
3	The bidder should have an annual turnover of Rs. 75 lakhs on an average during the last 3 years (Financial year FY 2021-22 & FY 2022-23 & FY 2023-24) in the supply of Similar items between 01-04-2019 and 31-03-2024.	
4	PO and Satisfactory Work completion certificate by the end user for the previous executed orders shall be submitted without which offer will not be considered.	
5	Audited balance sheet & Profit & Loss A/c is to be submitted (or) Copy of the IT return filed / audited last 3 years financial statements for Financial year FY 2021-22 & FY 2022-23 & FY 2023-24	
6	Vendor must undertake supply of valves as per the specifications and requirements indicated in the RFP.	
7	Latest solvency certificate from any Nationalized/Scheduled bank shall be submitted for a value of minimum Rs.30 lakhs. The solvency certificate must have issued after March 2024.	
8	Technical compliance to the specifications shall be vetted by the bidder.	
9	The firm must provide a self-declaration that they have not been black listed by any Govt. Department/PSU.	

Note:

Technical proposal of the bidder, which is not able to substantiate/satisfy the claims made by it with respect to the technical requirements laid down in this RFP, will be summarily rejected.

Offers of those bidders taking full scope of the supply as per the requirements indicated in the RFP only will be considered.

Signature of Authorized Person with Seal

Evaluation Criteria **Format-11**

The broad guidelines for evaluation of Bids will be as follows:

Sl.No	Description	Vendor Compliance
1	In respect of Two-Bid system, the technical Bids forwarded by the Bidders will be evaluated by the Department with reference to the technical specifications as mentioned in the RFP. The compliance of Technical Bids would be determined on the basis of the parameters specified in the RFP. The Price Bids of only those Bidders will be opened whose Technical Bids would clear the technical evaluation.	
2	During evaluation, SDSC SHAR may request Bidder for any clarification on the bid, additional documents.	
3	Bidder must provide the point-by-point compliance to the technical specifications along with deviations. The tender can be rejected if the deviations are not acceptable to the Department.	
4	Performance of Bidder on similar nature of supplies executed/ under execution shall be taken into consideration before selecting the Bidder for opening his price bid.	
5	The time schedule for completion is given in the Proposal document. Bidder is required to confirm the completion period unconditionally.	
6	SDSC SHAR reserves the right to reject any bid if technically/commercially not meeting the requirement/terms & conditions. Such decisions by the SDSC SHAR shall bear no liability whatsoever consequent upon such decision.	
7	Department reserves the right to split the scope of supply among the bidders based on technically suitable item wise lowest offer for a category. The bidders should accept this un-conditionally	
8	Total price inclusive of all taxes, duties, shall be considered for arriving item wise L1 and awarding the contract as per the procedures.	
9	If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price will prevail and the total price will be corrected. If there is a discrepancy between words and figures, the amount in words will prevail for calculation of price.	
10	Department reserves the right to inspect the contractor shop floor/premises for evaluation, if required. After evaluating the contractor, decision of the Department is final.	

Signature of Authorized Person with Seal

Price Bid format **Format-12**

Sl. No.	Description	Units	Qty. Nos.	Unit cost (Including Transportation, & Testing Charges) Rs.	Applicable Tax in Rs.	Applicable Tax in Percentage	Total cost Rs.
1.0	**Supply of SS Manual Ball valves and spare kits as per the specification in Chapter-01 (Unit cost inclusive of spares cost)**						
1.1	150NB SS MANUAL BALL VALVE FLANGED 150#	Nos.	3	*	*	#	*
1.2	100NB SS MANUAL BALL VALVE FLANGED 150#	Nos.	8	*	*	#	*
1.3	80NB SS MANUAL BALL VALVE FLANGED 150#	Nos.	10	*	*	#	*
1.4	50NB SS MANUAL BALL VALVE FLANGED 150#	Nos.	15	*	*	#	*
1.5	40NB SS MANUAL BALL VALVE FLANGED 150#	Nos.	10	*	*	#	*
1.6	25NB SS MANUAL BALL VALVE FLANGED 150#	Nos.	25	*	*	#	*
1.7	15NB SS MANUAL BALL VALVE FLANGED 150#	Nos.	60	*	*	#	*
1.8	25NB SS MANUAL BALL VALVE SOCKET WELDED 800#	Nos.	20	*	*	#	*
1.9	15NB SS MANUAL BALL VALVE SOCKET WELDED 800#	Nos.	25	*	*	#	*
1.10	25NB SS MANUAL BALL VALVE NPT THD 800#	Nos.	20	*	*	#	*
1.11	15NB SS MANUAL BALL VALVE NPT THD 800#	Nos.	45	*	*	#	*
2.0	**Supply of SS Electro Pneumatic Ball Valves as per the specification in Chapter-02**			*	*	#	*
2.1	80NB SS EP BALL VALVE, FLANGED 150#	Nos.	3	*	*	#	*
2.2	50NB SS EP BALL VALVE, FLANGED 150#	Nos.	15	*	*	#	*
2.3	40NB SS EP BALL VALVE, FLANGED 150#	Nos.	4	*	*	#	*
2.4	25NB SS EP BALL VALVE, FLANGED 150#	Nos.	8	*	*	#	*
	Supply of Spares for SS Electro Pneumatic Ball valves as per the specification in Chapter-02						
2.5	80NB SS EP BALL VALVE, FLANGED 150#	Sets	2	*	*	#	*
2.6	50NB SS EP BALL VALVE, FLANGED 150#	Sets	2	*	*	#	*
2.7	40NB SS EP BALL VALVE, FLANGED 150#	Sets	2	*	*	#	*
2.8	25NB SS EP BALL VALVE, FLANGED 150#	Sets	2	*	*	#	*
3.0	**Supply of Electro Pneumatic Wafer Type Butterfly Valves**						

Sl. No.	Description	Units	Qty. Nos.	Unit cost (Including Transportation, & Testing Charges) Rs.	Applicable Tax in Rs.	Applicable Tax in Percentage	Total cost Rs.
	as per the specifications in Chapter-03						
3.1	300 NB EP WAFER TYPE BUTTERFLY VALVE	Nos.	2	*	*	#	*
3.2	200 NB EP WAFER TYPE BUTTERFLY VALVE	Nos.	7	*	*	#	*
3.3	150 NB EP WAFER TYPE BUTTERFLY VALVE	Nos.	3	*	*	#	*
3.4	100 NB EP WAFER TYPE BUTTERFLY VALVE	Nos.	10	*	*	#	*
	Supply of EP Butterfly Valve soft spares kit for above units as per specifications in Chapter-03						
3.5	300 NB EP WAFER TYPE BUTTERFLY VALVE	Sets	2	*	*	#	*
3.6	200 NB EP WAFER TYPE BUTTERFLY VALVE	Sets	2	*	*	#	*
3.7	150 NB EP WAFER TYPE BUTTERFLY VALVE	Sets	2	*	*	#	*
3.8	100 NB EP WAFER TYPE BUTTERFLY VALVE	Sets	2	*	*	#	*
	Supply of EP Valve Actuator spares kit for above units as per specifications in Chapter-03						
3.9	300 NB EP WAFER TYPE BUTTERFLY VALVE	Sets	2	*	*	#	*
3.10	200 NB EP WAFER TYPE BUTTERFLY VALVE	Sets	2	*	*	#	*
3.11	150 NB EP WAFER TYPE BUTTERFLY VALVE	Sets	2	*	*	#	*
3.12	100 NB EP WAFER TYPE BUTTERFLY VALVE	Sets	2	*	*	#	*
4.0	**Supply of CS Manual Ball valves as per the specification in Chapter-04**						
4.1	40NB MANUAL BALL VALVE FLANGED 150#	Nos.	5	*	*	#	*
4.2	25NB MANUAL BALL VALVE FLANGED 150#	Nos.	10	*	*	#	*
4.3	15NB MANUAL BALLVALVE FLANGED 150#	Nos.	10	*	*	#	*
4.4	25NB MANUAL BALL VALVE SOCKET WELDED 800#	Nos.	20	*	*	#	*
4.5	15NB MANUAL BALL VALVE SOCKET WELDED 800#	Nos.	20	*	*	#	*
4.6	25NB MANUAL BALL VALVE NPT THD 800#	Nos.	25	*	*	#	*
4.7	15NB MANUAL BALL VALVE NPT THD 800#	Nos.	45	*	*	#	*
	Supply of Spares for above CS Manual ball valves as per the specification in Chapter-04						
4.8	40NB MANUAL BALL VALVE FLANGED 150#	Sets	2	*	*	#	*

Sl. No.	Description	Units	Qty. Nos.	Unit cost (Including Transportation, & Testing Charges) Rs.	Applicable Tax in Rs.	Applicable Tax in Percentage	Total cost Rs.
4.9	25NB MANUAL BALL VALVE FLANGED 150#	Sets	2	*	*	#	*
4.10	15NB MANUAL BALLVALVE FLANGED 150#	Sets	2	*	*	#	*
4.11	25NB MANUAL BALL VALVE SOCKET WELDED 800#	Sets	4	*	*	#	*
4.12	15NB MANUAL BALL VALVE SOCKET WELDED 800#	Sets	4	*	*	#	*
4.13	25NB MANUAL BALL VALVE NPT THD 800#	Sets	4	*	*	#	*
4.14	15NB MANUAL BALL VALVE NPT THD 800#	Sets	5	*	*	#	*
5.0	**Supply of CS Manual Butterfly valves as per the specification in Chapter-05**						
5.1	200 NB MANUAL BUTTERFLY VALVE	Nos	16	*	*	#	*
5.2	150 NB MANUAL BUTTERFLY VALVE	Nos	8	*	*	#	*
5.3	100 NB MANUAL BUTTERFLY VALVE	Nos	12	*	*	#	*
5.4	80 NB MANUAL BUTTERFLY VALVE	Nos	10	*	*	#	*
5.5	50 NB MANUAL BUTTERFLY VALVE	Nos	10	*	*	#	*
	Supply of spare gear units for operation of above Manual butterfly valves of the following sizes as per the specification in Chapter-05						
5.6	200 NB MANUAL BUTTERFLY VALVE	Nos	2	*	*	#	*
5.7	150 NB MANUAL BUTTERFLY VALVE	Nos	2	*	*	#	*