

# **TECHNICAL SPECIFICATIONS FOR SUPPLY OF MULTI PNEUMATIC QUICK CONNECTOR AND DIS-CONNECTOR (QCDC) PLATES ASSEMBLY**

## **1. Scope:**

The Scope involves Design, Engineering, Development, realization, testing, qualification and supply of "**Multi Pneumatic Quick Connector and Dis-connector (QCDC) plates assembly**" as per given technical specifications.

## **2. Design & Development Philosophy:**

The Supplier has to carry out the following activities as per the sequence towards design & development process.

- i. Configuration study and Optimization.
- ii. *3D Solid modeling* using Solid works/CATIA/ANSYS or equivalent (Vendor has to submit the solid model in actual exe.file/pdf/other equivalent file type to the purchaser.
- iii. *2D Design drawings* (Exploded view with part name & numbers)
- iv. Design Calculations as per applicable standards
- v. Design as per the purchaser proposed configuration
- vi. Flow and stress analysis results
- vii. Pressure drop calculations across the unit
- viii. Realization of the hardware as per standards
- ix. Testing & qualification at supplier premises and clearance for dispatch
- x. Testing and acceptance at purchaser premises

**Note 1:** *The supplier can suggest any modifications/change of configuration on the schematic drawing for ease of manufacturing or for betterment. The proposed changes or modification may be mutually discussed and it shall be implemented after getting approval from the department.*

## **3. Technical Specifications:**

Umbilical joint is to be designed for quick mating and demating of group of metallic flexible hoses for the supply of fluids. The following inputs shall be considered for the design of umbilical joints. Typical drawing of the umbilical connector is given in schematic drawing.

- a) Umbilical joint consists of two plates of size 200x200 mm (approx.) with the required thickness and associated piping connectors with suitable clamping arrangement. Size of the plates may vary as per the actual design but it shall be optimum.
- b) Material of construction for the plates, associated piping connectors and internals of auto seal device, etc shall be of stainless steel SS304/SS304L/SS316/SS316L.
- c) QCDC outer joints connecting to flexible hoses shall be provided with 4 Nos. of fluid connections to mate to the respective piping with suitable joint (Sealing Configuration: Conical seat with 60 Deg. Angle or as per manufacturer standard). Standard to be specified
- d) Both umbilical plates shall be provided with suitable auto seal device in the fluid passage lines to avoid ambient air entry into the system when umbilical plate is in demated condition and each valve has to hold the minimum preservation pressure of 0.7 Bar (g).
- e) The interface joint shall be leak tight, better than  $1 \times 10^{-5}$  Std. cc/Sec. with gaseous helium at MOP.
- f) Upon mating the umbilical plate, ASD provided on the fluid passage shall open and should not create additional resistance (Passage area should be equal or more than the hose cross section area.
- g) A breather hole of 2 mm shall be provided for each fluid line for monitoring the leak at the umbilical plate interface joint.
- h) For precise mating, suitable locator/guide pins shall be provided on the interface plates to take care of any misalignments on xyz directions.
- i) After mating proper clamping arrangement to be provided to take care of process pressure loads to lock the plates firmly in assembled position.
- j) Provision for spanner access for the tightening of process piping connections shall be considered while finalizing the connector locations.
- k) Operating medium, operating pressure and bore diameter of each process line along with end connections are given in Table-1 (Layout of connectors are marked as 1 to 4 in the drawing).
- l) handling provision shall be provided for both the plates
- m) Mating and demating of the umbilical plates shall be automatic with pneumatic actuator.

- n) Mating and de-mating shall be controlled through a PC based control system or better.
- o) Proximity sensor/limit switch shall be provided between the plates to control the engagement and dis engagement position.

**Note 2:** *Concept and dimensions provided are typical. Based on the detailed engineering suitable dimensions and concepts can be adopted.*

**TABLE-1**

Sl.No	Medium	Pressure (Bar)	Temperature (K)	Bore dia. (mm)	End Connection	Remarks
1.	Helium	70	300	8	M18x1.5	
2.	Helium	10	300	32	M45x1.5	
3.	Helium	10	300	12	M22x1.5	
4.	Helium	10	300	16	M27x1.5	

**4. General Technical specifications:**

- a. All the wetted parts & critical tolerances shall be machined with CNC Machines only and fabricated as per the approved fabrication drawings.
- b. The supplier shall be the manufacturer of QCDCs and shall have functional test facilities in their own premises.
- c. All the Major components shall be machined from forged bar stocks of SS304/SS304L/SS316/SS316L. These materials have to be tested in reputed laboratories for their mechanical properties, IGC (Raw material) and chemical analysis.
- d. Party shall submit fabrication drawings for approval prior to commencement of fabrication.
- e. Umbilical connector shall be suitable for Bi-Directional flow.

**f. Scope of Supply:**

- i. Multi Pneumatic QCDC umbilical Plates, umbilical connector and Sub-assemblies.
- ii. Pneumatic actuator with command pressure of 7-8 bar (g) with a minimum stroke of 150mm.
- iii. Suitable instrumentation elements for position, control and health monitoring with suitable interface along with control panel.

**g. Scope of Testing:**

- i. Material testing & Inspection @ Suppliers Premises/ Approved labs:
- ii. All threaded End connections shall be free from Burs, scratches and dents. Suitable inspection tools like micrometer, thread gauges (GO & NOGO gauges) etc shall be supplied by party during inspection.
- iii. After fabrication, the multi coupler plate joint shall be qualified for its integrity, pressure check, flow rate verifications and interfaces check in the appropriate test set up.
- iv. All sub-assemblies and related components shall be cleaned for oxygen service and assembly shall be carried out in the clean room.
- v. All butt weld joints shall be 100% radiographically inspected by X-ray or by gamma ray for its soundness.
- vi. The following tests have to be carried out for all SS material and the sample selection shall be one sample per Lot/Heat.
  - vi.i. Mechanical and Chemical tests
  - vi.ii. IGC Practice E test as per ASTM 262

**h. Qualification tests @ Suppliers Premises:**

- i. Hydro testing of the entire assembly with DM water in mated condition with respective equivalent end interfaces at 1.5 x MOP.
- ii. Pneumatic strength testing of individual assembly in mated condition with respective equivalent end interfaces at 1.25 x MOP.

**i. Acceptance tests @ Purchaser Premises:**

- i. Pneumatic Leak testing of entire assembly in mated condition with respective equivalent end interfaces at MOP.
- ii. MSLD Leak Testing (better than  $1 \times 10^{-5}$  mbar.lit/s) at MOP. However, *permissible leak rates shall be worked out by the supplier based on the selection of soft seals and to be submitted for approval.*
- j. Welding shall be carried out with Electron beam/ Laser / Plasma/ TIG welding only.

- k. The assembly unit shall be legibly marked by engraving as per designation given for easy identification with model No., Max. Operating pressure, end connections, umbilical designation and serial No. etc.on both the plates.
- l. The entire assembly shall be dis-assembled and shall be properly packed with sufficient cushion pads to avoid shock loads for safe transportation and shall have to be delivered to SDSC-SHAR, Sriharikota. All the items shall be delivered within 8 months from the date of placement of purchase Order.
- m. All design, fabrication drawings, testing procedure and calculations shall be submitted to department along with the supply.

**5. Documents to be submitted along with goods:**

**Production of Master file:** One copy of production master file shall be supplied along with one digital copy (containing Scanned Originals) and shall contain the following:

- 5.1 Certificate of Warranty.
- 5.2 Design document and drawings
- 5.3 Material test certificates (Physical, chemical properties & IGC), cleaning and visual inspection.
- 5.4 Certificate of cleaning for oxygen service
- 5.5 Visual, dimensional checks and final inspection reports
- 5.6 Certificate of conformance.

**6. General Conditions:**

- 6.1 The supplier shall quote for comprehensive unit price for the entire assembly (Inclusive of engineering, design, development, testing, supply, erection and demonstration at purchasers' premises). The price shall be inclusive of prices of all the parts indicated,testing charges and threaded dummy caps for all interfaces.
- 6.2 Final assembled Multi Pneumatic Quick Connector and Dis-connector (QCDC) plates shall be clean and dry. Inside surface of Multi Coupler Pneumatic Quick Connection Dis-connection (QCDC) Plates shall be cleaned for Oxygen service.
- 6.3 Wherever material of construction of minor parts is not mentioned, it shall be of SS304L/SS304/SS316/SS316L only. Any other material is not acceptable.

- 6.4 The tenderer shall submit a detailed plan of (QAP) applicable examinations and tests required for the individual components and assembly prior to the commencement of manufacturing. The same will be reviewed and approved by the department. All inspection and testing shall be carried out as per approved QAP by purchaser. A tentative QAP (Quality Assurance Plan) may be followed as given in theTable-4.
- 6.5 All Multi Pneumatic Quick Connector and Dis-connector (QCDC) plates shall be supplied with threaded end closures made from Aluminum/stainless steel/Brass. The total QCDC assembly shall be Properly packed in seaworthy cases.
- 6.6 **WARRANTY:** The Equipment with accessories supplied shall be warranted for trouble free service of 12 months period from the date of receipt and acceptance or 18 months from the date of supply. In case any defects are noticed during the above period due to faulty design, poor workmanship, use of substandard materials etc., the same shall be rectified / replaced by party with free of cost within a reasonable period.
- 6.7 All correspondence and documents shall be supplied only in English version.
- 6.8 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 of tendering, 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 entity 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.

**7. Bid/Offer Submission details:**

- a) **Supplier shall present the bids on two-part basis as highlighted below:**

- ✓ **Part-I: Techno-Commercial bid.**
- ✓ **Part-II: Price bid indicating the price.**

**7.1 Part-I: Techno-Commercial bid:**

**The tenderer shall necessarily present the following in the techno-commercial bid:**

- a. The tenderer shall furnish **point-wise confirmation (Technical Compliance attached in Annexure-II)** for the technical specifications given in the enquiry. However, change of specifications/ deviations (if any) shall be brought out in the offer with detailed justification. Suppliers are expected to furnish quotations with best match to design standards, materials of construction and other technical conditions.
- b. Supplier has to provide previous purchase orders (P.O.) of Pneumatic Quick Connection Dis-connectors (QCDC).
- c. Tenderer need to furnish the details related to commercial terms indicating payment terms, details of bank guarantee in case of advance payments.
- d. Bidder need to submit Un-priced price bid copy (as highlighted below) indicating the description, without indicating the price. Tenderer shall note that indication of price in the techno-commercial bid will lead to dis-qualification of the supplier in the evaluation of bid.
- e. The price bids will be opened only after evaluation and acceptance of the technical bid of the respective tenderer.



**7.2 Format of Un-Priced Price Bid:**

**Confirmation of cost break up by the supplier**

**Table-2**

Sl. No	Description	Quantity (Nos)	Unit Cost	Total Cost	Taxes if any	Total Cost including Tax	Separate Cost mentioned in price bid (YES/NO)
1.	Multi Pneumatic Quick Connector and Dis-connector (QCDC) plates.	1	Unpriced	Unpriced	Unpriced	Unpriced	

**7.3 Part-II: Price bid indicating the price:**

Price bid should be submitted by the tenderer in the following format shall be uploaded.

**Table-3**

Sl. No	Description	Quantity (Nos)	Unit Cost	Total Cost	Taxes if any	Total Cost including Tax
1.	Multi Pneumatic Quick Connector and Dis-connectors (QCDC) plates	1				

**Note:**

- 1. Total price of Multi Pneumatic Quick Connector Dis-connector (QCDC) Plates shall be inclusive of all costs (Eg. All testing charges, Pneumatic actuator, sub-assemblies, sensors and connectors costs and any other as applicable).**

## 8. Offer Validity:

The validity of the offers / tenders should be 120 days from the date of opening of the tenders. **Tenders with offer validity less than the period mentioned above, will not be considered for evaluation.**

## 9. Taxes:

a. GST details are given below:

GSTIN	: 37AAAGS1366J1Z1
LEGAL NAME	: SATISH DHAWAN SPACE CENTRE SHAR
VALIDITY FROM	: 29/08/2017
TYPE OF REGISTRATION	: REGULAR

## 10. Payment Terms:

100% payment within 30 days after receipt and acceptance of items at purchaser's (SDSC-SHAR, Sriharikota) site.

## 11. Mode of Payment:

Bidders can submit the banker details and payments can be made through NEFT/RTGS/ECS through PFMS.

## 12. Liquidated Damages:

In all cases, delivery schedule indicated in the Purchase Order/Contract is the essence of the contract and if the party fails to deliver the material within the delivery schedule, Liquidated Damages will be levied @ 0.5% per week or part thereof subject to a maximum of 10% of total order value.

## 13. Performance Bank Guarantee:

Performance Bank Guarantee for 3% of the order value should be furnished in the form of Bank Guarantee from nationalized/scheduled bank till warranty period (12 months) plus sixty days.

## 14. Security Deposit:

Security Deposit for 3% of the order value is mandatory. Party shall furnish the Security Deposit in the form of Bank Guarantee from nationalized/scheduled bank or by Demand Draft valid till completion of the contract period plus sixty days for faithful execution of the contract.

## **15. Combined Bank Guarantee:**

Combined Bank Guarantee for performance bank guarantee & security deposit of 3% of the order value should be furnished in the form of Bank Guarantee from nationalized/scheduled bank till warranty period plus sixty days **within 10 days from the receipt of PO**

## **16. 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 Contract, 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 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 Contract shall be continued by the CONTRACTOR 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.

## **17. Minimum qualification criteria:**

- a. Tenderers should have satisfactorily executed the order for supply of Multi Pneumatic Quick Connection Dis-connector (QCDC) Plates involving complete manufacturing and supply during the last five years ending with 31-03-2024 at least.
  - Details of the last five years similar purchase orders shall be submitted along with the offer for proof of above.
- b. The firm must provide a self-declaration that there is no complaint/vigilance inquiry against them in any

Govt./Department/PSU and they have not been black listed by any Govt. Department/PSU.

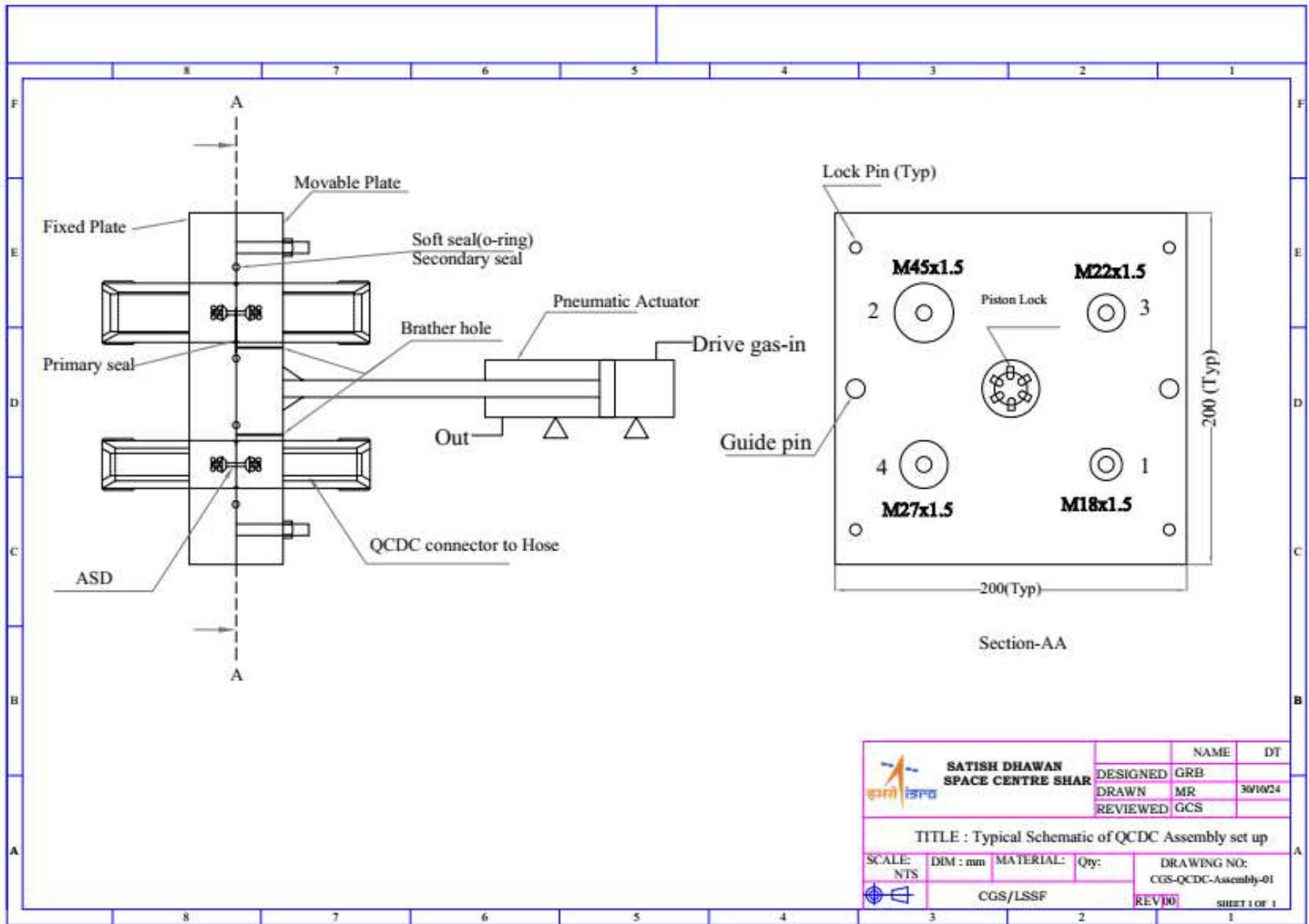
- c. Technical proposal of the bidder, which is not able to substantiate/satisfy the claims made by it with respect to the technical requirements laid down in this tender document, will be summarily rejected.
- d. **Manufacturers of Quick Connector Dis-connectors only shall submit the quote. Manufacturing through sub vendors is not acceptable.**
- e. The tenderer shall necessarily furnish the details of previously executed orders confirming the design, fabrication and delivery of Multi Pneumatic Quick Connector and Dis-connector (QCDC) plates. Necessary documentary evidence along with end user certificate (confirming the satisfactory performance of the goods supplied) shall be submitted along with offer as a mandatory requirement. Non-submission of relevant end user certificate / Performance certificate/ Pre delivery certificate of similar items shall lead to technical disqualification of the offer.
- f. Offers of those bidders taking full scope of the work as per the requirements indicated in the tender document only will be considered.
- g. The bidders of QCDC manufacturers shall provide scheme, 2D and 3D drawings of proposed QCDC, flow rate calculations and Pressure drop across umbilical with any inert gas. All these minimum requirements shall be submitted along with the offer, otherwise offer will not be considered.


#### **18. Bid Evaluation criteria:**

- a. 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 Specification document. The compliance of Technical Bids would be determined on the basis of the parameters specified in the specification. The Price Bids those Bidders will be opened whose Technical Bids would clear the technical evaluation
- b. During evaluation, SDSC SHAR may request Bidder for any additional clarification/document on the bid, if required
- c. Performance of Bidder on similar nature of works executed/ under execution will be taken into consideration before selecting the Bidder for opening his price bid (as per qualification criteria)

- d. SDSC SHAR reserves the right to reject any bid if not meeting the technical/commercial requirements and terms & conditions. Such decisions by the SDSC SHAR shall bear no liability whatsoever consequent upon such decision.
- e. **Minimum technical information regarding the QCDC shall be provided as given in Min. Qualification criteria as given in 17(g) without which bidder will not be considered for evaluation.**
- f. Purchaser reserves the right for evaluation of any bidder by visiting his manufacturing premises towards acceptance of the techno-commercial bid. The decision of the purchaser is final in this regard
- g. Preference will be given to MSME as per public procurement policy

# Schematic of QCDC Plates



 <b>SATISH DHAWAN SPACE CENTRE SHAR</b>		NAME	DT
		DESIGNED	GRB
		DRAWN	MR
		REVIEWED	GCS
<b>TITLE : Typical Schematic of QCDC Assembly set up</b>			
SCALE: NTS	DIM : mm	MATERIAL: Qty:	DRAWING NO: CGS-QCDC-Assembly-01
CGS/LSSF		REV 00	SHEET 1 OF 1

## 19. Quality Assurance Plan (QCDC)

Table-4

Sl. No	Characteristics/ type of check	Ref. Document	Method of check	Quantum of check	
				Suppliers QC	Purchasers Inspections
1.	Review of fabrication drawings before commencement of production.	As per the drawings	Review	100% H	100% H
<b>On Raw Material(From NABL Accredited Labs)</b>					
2.	Chemical and Mechanical testing (per heat/lot/ each size of the rod/plate)	ASTM A182 (SS304/304L/316 /316L)	Review of test certificates	100% R	100% R
3.	IGC (per heat/lot/ each size of the rod)	ASTM 262 Practice E		100% R	100% R
4.	For Viton Material /soft seals	As per standard		100% R	100% R
<b>On Finished Product(From NABL Accredited Labs)</b>					
5.	Chemical testing (per heat/lot/each size of the rod)	ASTM A182	Review of test certificates	100% R	100% R
6.	IGC (per heat/lot/ each size of the rod)	ASTM 262	Review of test certificates	RN	RN
7.	Dimensional and Visual inspection	As per the drawings	Checking as per drawing and visual inspection	100% W	10% RN
8.	Dimensional inspection reports	As per P.O	Verification of documents and certificates	100% R	100% R

**Technical Compliance**  
**(To be submitted by the bidder along with Technical Bid)**

Tenderer shall furnish point-wise confirmation for the following. Change of specifications/ deviations (if any) shall be brought out in the offer with detailed justification.

Sl. No	ISRO Description	Technical Compliance (To be filled by the party)
<b>Design&amp; Development Philosophy:</b>		
1.	Design, Engineering, Development, realization, testing, qualification and supply of <b>“Multi Pneumatic Quick Connector and Disconnector (QCDC) plates assembly”</b> as per given technical specifications is in the scope of supplier.	
2.	<p>The Supplier has to carry out the following activities as per the sequence towards design &amp; development process.</p> <ol style="list-style-type: none"><li>1. Configuration study and Optimization.</li><li>2. <i>3D Solid modeling</i> using Solid works/CATIA/ANSYS or equivalent (Vendor has to submit the solid model in actual exe.file/pdf/other equivalent file type to the purchaser.</li><li>3. <i>2D Design drawings</i> (Exploded view with part name &amp; numbers)</li><li>4. Design Calculations as per applicable standards</li><li>5. Design as per the purchaser proposed configuration</li><li>6. Flow and stress analysis results</li><li>7. Pressure drop calculations across the unit</li><li>8. Realization of the hardware as per standards</li><li>9. Testing &amp; qualification at supplier premises and clearance for dispatch.</li></ol>	



Sl. No	ISRO Description	Technical Compliance (To be filled by the party)
	10. Testing and acceptance at purchaser premises.	
3.	<i>The supplier can suggest any modifications/change of configuration on the schematic drawing for ease of manufacturing or for betterment. The proposed changes or modification may be mutually discussed and it shall be implemented after getting approval from the department.</i>	
<b>Technical Specifications:</b>		
4.	Umbilical joint is to be designed for quick mating and demating of group of metallic flexible hoses. The following inputs shall be considered for the design of umbilical joints. Typical drawing of the umbilical connector is given in schematic drawing.	
5.	Umbilical joint consists of two plates of size 200x200 mm (approx.) with the required thickness and associated piping connectors with suitable clamping arrangement. Size of the plates may vary as per the actual design but it shall be optimum.	
6.	Material of construction for the plates, associated piping connectors and internals of auto seal device, etc shall be of stainless steel SS304/SS304L/SS316/SS316L.	
7.	QCDC outer joints connecting to flexible hoses shall be provided with 4 Nos. of fluid connections to mate to the respective piping with suitable joint (Sealing Configuration: Conical seat with 60 Deg. Angle or as per manufacturer standard). Standard to be specified	
8.	Both umbilical plates shall be provided with suitable auto seal device in the fluid passage lines to avoid ambient air entry into the system when	

<b>Sl. No</b>	<b>ISRO Description</b>	<b>Technical Compliance (To be filled by the party)</b>
	umbilical plate is in demated condition and each valve has to hold the minimum preservation pressure of 0.7 Bar (g).	
9.	The interface joint shall be leak tight, better than $1 \times 10^{-5}$ Std. cc/Sec. with GHe at MOP.	
10.	Upon mating the umbilical plate, ASD provided on the fluid passage shall open and should not create additional resistance (Passage area should be equal or more than the hose cross section area. A breath hole of 2 mm shall be provided for each fluid line for monitoring the leak at the umbilical plate interface joint.	
11.	A breather hole of 2 mm shall be provided for each fluid line for monitoring the leak at the umbilical plate interface joint.	
12.	For precise mating, suitable locator/guide pins shall be provided on the interface plates to take care of any misalignments on xyz directions.	
13.	After mating proper clamping arrangement to be provided to take care of process pressure loads to lock the plates firmly in assembled position	
14.	Provision for spanner access for the tightening of process piping connections shall be considered while finalizing the connector locations.	
15.	Operating medium, operating pressure and bore diameter of each process line along with end connections are given in Table-1 of Annexure-I (Layout of connectors are marked as 1 to 4 in the drawing).	
16.	handling provision shall be provided for both the plates	
17.	Mating and demating of the umbilical plates is automatic with pneumatic actuator.	

Sl. No	ISRO Description	Technical Compliance (To be filled by the party)
18.	Mating and de-mating shall be controlled through a PC based control system or better.	
19.	Proximity sensor/limit switch shall be provided between the plates to control the engagement and dis engagement position.	
20.	<i>Concept and dimensions provided are typical. Based on the detailed engineering suitable dimensions and concepts can be adopted.</i>	
<b>General Technical Specifications:</b>		
21.	All the wetted parts & critical tolerances shall be machined with CNC Machines only and fabricated as per the approved fabrication drawings.	
22.	The supplier shall be the manufacturer of QCDC and shall have functional test facilities in their own premises.	
23.	All the Major components shall be machined from forged bar stocks of SS304/SS304L/SS316/SS316L. These materials have to be tested in reputed laboratories for their mechanical properties, IGC (Raw material) and chemical analysis.	
24.	Party shall submit fabrication drawings for approval prior to commencement of fabrication.	
25.	Umbilical connector shall be suitable for Bi-Directional flow.	
26.	<p><b>Scope of Supply:</b></p> <ul style="list-style-type: none"> <li>i. Multi Pneumatic QCDC umbilical Plates, umbilical connector and Sub-assemblies.</li> <li>ii. Pneumatic actuator with command pressure of 7-8 bar (g) with a minimum stroke of 150mm.</li> <li>iii. Suitable instrumentation elements for position and health monitoring with suitable interface along with control panel.</li> </ul>	
27.	<b>Scope of Testing:</b>	

<b>Sl. No</b>	<b>ISRO Description</b>	<b>Technical Compliance (To be filled by the party)</b>
	a. Material testing & Inspection @ Suppliers Premises/ Approved labs: b. All threaded End connections shall be free from Burs, scratches and dents. Suitable inspection tools like micrometer, thread gauges (GO & NOGO gauges) etc shall be supplied by party during inspection.	
28.	After fabrication, the multi coupler plate joint shall be qualified for its integrity, pressure check, flow rate verifications and interfaces check in the appropriate test set up.	
29.	All sub-assemblies and related components shall be cleaned for oxygen service and assembly shall be carried out in the clean room.	
30.	All butt weld joints shall be 100% radiographically inspected by X-ray or by gamma ray for its soundness.	
31.	The following tests have to be carried out for all SS material and the sample selection shall be one sample per Lot/Heat.  i. Mechanical and Chemical tests ii. IGC Practice E test as per ASTM 262.	
	<b>Qualification tests @ Suppliers Premises:</b>  a. Hydro testing of the entire assembly with DM water in mated condition with respective equivalent end interfaces at 1.5 x MOP. b. Pneumatic strength testing of individual assembly in mated condition with respective equivalent end interfaces at 1.25 x MOP.	
	<b>Acceptance tests @ Purchaser Premises:</b>  a. Pneumatic Leak testing of entire assembly in mated condition with respective equivalent end interfaces at MOP. b. MSLD Leak Testing (better than $1 \times 10^{-5}$	

Sl. No	ISRO Description	Technical Compliance (To be filled by the party)
	mbar.lit/s) at MOP. However, <i>permissible leak rates shall be worked out by the supplier based on the selection of soft seals and to be submitted for approval.</i>	
32.	Welding shall be carried out with Electron beam/ Laser / Plasma/ TIG welding only.	
33.	The assembly unit shall be legibly marked by engraving as per designation given for easy identification with model No., Max. Operating pressure, end connections, umbilical designation and serial No. etc.on both the plates.	
34.	The entire assembly shall be dis-assembled and shall be properly packed with sufficient cushion pads to avoid shock loads for safe transportation and shall have to be delivered to SDSC-SHAR, Sriharikota. All the items shall be delivered within 8 months from the date of placement of purchase Order.	
35.	The supplier shall quote for comprehensive unit price for the entire assembly (Inclusive of engineering, design, development, testing, supply, erection and demonstration at purchasers' premises). The price shall be inclusive of prices of all the parts indicated, testing charges and threaded dummy caps for all interfaces.	
36.	All design, fabrication drawings, testing procedure and calculations shall be submitted to department along with the supply.	
<b>Documents to be submitted along with goods:</b>		
37.	<b>Production of Master file:</b> One copy of production master file shall be supplied along with one digital copy (containing Scanned Originals) and shall contain the following:	
38.	Certificate of Warranty.	

SI. No	ISRO Description	Technical Compliance (To be filled by the party)
39.	Design document and drawings	
40.	Material test certificates (Physical, chemical properties & IGC), cleaning and visual inspection.	
41.	Certificate of cleaning for oxygen service	
42.	Visual, dimensional checks and final inspection reports	
43.	Certificate of conformance.	
<b>General Conditions:</b>		
44.	The supplier shall quote for comprehensive unit price for the entire assembly (Inclusive of engineering, design, development, testing, supply, erection and demonstration at purchasers' premises). The price shall be inclusive of prices of all the parts indicated, testing charges and threaded dummy caps for all interfaces.	
45.	Final assembled Multi Pneumatic Quick Connector and Dis-connector (QCDC) plates shall be clean and dry. Inside surface of Multi Coupler Pneumatic Quick Connection Dis-connection (QCDC) Plates shall be cleaned for Oxygen service.	
46.	Wherever material of construction of minor parts is not mentioned, it shall be of SS304L/SS304/SS316/SS316L only. Any other material is not acceptable.	
47.	The tenderer shall submit a detailed plan of (QAP) applicable examinations and tests required for the individual components and assembly prior to the commencement of manufacturing. The same will be reviewed and approved by the department. All	

Sl. No	ISRO Description	Technical Compliance (To be filled by the party)
	inspection and testing shall be carried out as per approved QAP by purchaser. A tentative QAP (Quality Assurance Plan) may be followed as given in theTable-4 of Annexure-I.	
48.	All Multi Pneumatic Quick Connector and Disconnector (QCDC) plates shall be supplied with threaded end closures made from Aluminum/stainless steel/Brass. The total QCDC assembly shall be Properly packed in seaworthy cases.	
49.	<b>WARRANTY:</b> The Equipment with accessories supplied shall be warranted for trouble free service of 12 months period from the date of receipt and acceptance or 18 months from the date of supply. In case any defects are noticed during the above period due to faulty design, poor workmanship, use of substandard materials etc., the same shall be rectified / replaced by party with free of cost within a reasonable period.	
50.	All correspondence and documents shall be supplied only in English version.	
51.	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	

<b>Sl. No</b>	<b>ISRO Description</b>	<b>Technical Compliance (To be filled by the party)</b>
	below). The bidder shall provide compliance and undertaking as per order and hereafter amendments:	
52.	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).	
53.	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.	
54.	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.	
55.	<p>Verification of local content:</p> <p>The Class I local supplier/ Class- II local supplier at the time of tendering, 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.</p>	
56.	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	



Sl. No	ISRO Description	Technical Compliance (To be filled by the party)
	percentage of local content.	
57.	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.	
58.	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.	
59.	The percentage of local content should be specifically mentioned in the offer, without which it will be summarily rejected.	
60.	Preference will be given to Class-I Local supplier and in their absence, Class-II Local supplier will be considered.	
61.	<p><b>Supplier shall present the bids on <u>two-part basis as highlighted below</u>:</b></p> <ul style="list-style-type: none"> <li>✓ <b>Part-I: Techno-Commercial bid.</b></li> <li>✓ <b>Part-II: Price bid indicating the price.</b></li> </ul>	
62.	Change of specifications/ deviations (if any) shall be brought out in the offer with detailed justification. Suppliers are expected to furnish quotations with best match to design standards, materials of construction and other technical conditions.	

Sl. No	ISRO Description	Technical Compliance (To be filled by the party)
63.	Supplier has to provide previous purchase orders (P.O.) of Pneumatic Quick Connection Dis-connectors (QCDC).	
64.	Tenderer need to furnish the details related to commercial terms indicating payment terms, details of bank guarantee in case of advance payments.	
65.	Bidder need to submit Un-priced price bid copy (as highlighted below) indicating the description, without indicating the price. Tenderer shall note that indication of price in the techno-commercial bid will lead to dis-qualification of the supplier in the evaluation of bid.	
66.	The price bids will be opened only after evaluation and acceptance of the technical bid of the respective tenderer.	
67.	Format of Un-Priced Price Bid: Confirmation of cost break up by the supplier shall be as per Table-2 in Annexure-I	
68.	Price bid should be submitted by the tenderer in the format as given in Table-3 in Annexure-I.	
69.	<b>Total price of Multi Pneumatic Quick Connector Dis-connector (QCDC) Plates shall be inclusive of all costs (Eg. All testing charges, Pneumatic actuator, sub-assemblies, sensors and connectors costs and any other as applicable).</b>	
70.	<b>Offer Validity:</b> The validity of the offers / tenders should be 120 days from the date of opening of the tenders.	

Sl. No	ISRO Description	Technical Compliance (To be filled by the party)
	<b>Tenders with offer validity less than the period mentioned above, will not be considered for evaluation.</b>	
71.	<p><b>20. Taxes:</b></p> <p>GST details are given below:  GSTIN : 37AAAGS1366J1Z1  LEGAL NAME: SATISH DHAWAN SPACE CENTRE SHAR  VALIDITY FROM: 29/08/2017  TYPE OF REGISTRATION: REGULAR</p>	
72.	<p><b>Payment Terms:</b></p> <p>100% payment within 30 days after receipt and acceptance of items at purchaser's (SDSC-SHAR, Sriharikota) site.</p>	
73.	<p><b>Mode of Payment:</b></p> <p>Bidders can submit the banker details and payments can be made through NEFT/RTGS/ECS through PFMS.</p>	
74.	<p><b>Liquidated Damages:</b></p> <p>In all cases, delivery schedule indicated in the Purchase Order/Contract is the essence of the contract and if the party fails to deliver the material within the delivery schedule, Liquidated Damages will be levied @ 0.5% per week or part thereof subject to a maximum of 10% of total order value.</p>	
75.	<p><b>Performance Bank Guarantee:</b></p> <p>Performance Bank Guarantee for 3% of the order value should be furnished in the form of Bank Guarantee from nationalized/scheduled bank till warranty period (12 months) plus sixty days.</p>	

Sl. No	ISRO Description	Technical Compliance (To be filled by the party)
76.	<p><b>Security Deposit:</b></p> <p>Security Deposit for 3% of the order value is mandatory. Party shall furnish the Security Deposit in the form of Bank Guarantee from nationalized/scheduled bank or by Demand Draft valid till completion of the contract period plus sixty days for faithful execution of the contract.</p>	
77.	<p><b>Combined Bank Guarantee:</b></p> <p>Combined Bank Guarantee for performance bank guarantee &amp; security deposit of 3% of the order value should be furnished in the form of Bank Guarantee from nationalized/scheduled bank till warranty period plus sixty days <b>within 10 days from the receipt of PO</b></p>	
78.	<p><b>Arbitration:</b></p> <p>In the event of any dispute/s, difference/s or claim/s arising out of or relating to the interpretation and application of the Contract, 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 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</p>	

<b>Sl. No</b>	<b>ISRO Description</b>	<b>Technical Compliance (To be filled by the party)</b>
	<p>Arbitrator shall be final and binding between the Parties. The applicable language for Arbitration shall be "English" only.</p> <p>Work under the Contract shall be continued by the CONTRACTOR 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.</p>	

**Minimum Qualification Criteria**  
**(To be submitted by the bidder along with Technical Bid)**

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

Sl.No	Description	Vendor Compliance with supporting documents
1.	<p>Tenderers should have satisfactorily executed the order for supply of Multi Pneumatic Quick Connection Dis-connector (QCDC) Plates involving complete manufacturing and supply during the last five years ending with 31-03-2024 at least.</p> <ul style="list-style-type: none"> <li>• Details of the last five years purchase orders shall be submitted along with the offer for proof of above.</li> </ul>	
2.	The firm must provide a self-declaration that there is no complaint/vigilance inquiry against them in any Govt./Department/PSU and they have not been black listed by any Govt. Department/PSU	
3.	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 tender document, will be summarily rejected	
4.	<b>Manufacturers of Quick Connector Dis-connectors only shall submit the quote. Manufacturing through sub vendors is not acceptable.</b>	
5.	The tenderer shall necessarily furnish the details of previously executed orders confirming the design, fabrication and delivery of Multi Pneumatic Quick Connector and Dis-connector (QCDC)	

Sl.No	Description	Vendor Compliance with supporting documents
	plates. Necessary documentary evidence along with end user certificate (confirming the satisfactory performance of the goods supplied) shall be submitted along with offer as a mandatory requirement. Non-submission of relevant end user certificate / Performance certificate/ Pre delivery certificate of similar items shall lead to technical disqualification of the offer.	
6.	Offers of those bidders taking full scope of the work as per the requirements indicated in the tender document only will be considered.	
7.	The bidders of QCDC manufacturers shall provide scheme, 2D and 3D drawings of proposed QCDC, minimum flow rate calculations and Pressure drop across umbilical with any inert gas. All these minimum requirements shall be submitted along with the offer, otherwise offer will not be considered.	

	SIGNATURE	:	
	NAME	:	
	DESIGNATION	:	
SEAL OF THE COMPANY	DATE	:	

**Bid Evaluation Criteria****(To be submitted by the bidder along with Technical Bid)**

Sl.No	Description	Vendor Compliance with supporting documents
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 Specification document. The compliance of Technical Bids would be determined on the basis of the parameters specified in the specification. The Price Bids those Bidders will be opened whose Technical Bids would clear the technical evaluation	
2.	During evaluation, SDSC SHAR may request Bidder for any additional clarification/document on the bid, if required	
3.	Performance of Bidder on similar nature of works executed/ under execution will be taken into consideration before selecting the Bidder for opening his price bid (as per qualification criteria)	
4.	SDSC SHAR reserves the right to reject any bid if not meeting the technical/commercial requirements and terms & conditions. Such decisions by the SDSC SHAR shall bear no liability whatsoever consequent upon such decision.	
5.	<b>Minimum technical information regarding the QCDC shall be provided as given in Min. Qualification criteria as given in 17(g) without which bidder will not be considered for evaluation.</b>	
6.	Purchaser reserves the right for evaluation of any bidder by visiting his manufacturing premises towards acceptance of the techno-commercial bid. The decision of the purchaser is final in this regard	
7.	Preference will be given to MSME as per public procurement policy	

	SIGNATURE	:	
	NAME	:	
	DESIGNATION	:	
SEAL OF THE COMPANY	DATE	:	