



भारत सरकार/Government of India
अंतरिक्ष विभाग/Department of Space
द्रव नोदन प्रणाली केंद्र
LIQUID PROPULSION SYSTEMS CENTRE
एच ए एल II स्टेज, 80 फीट रोड
HAL II STAGE, 80 FEET ROAD,
बेंगलूरु/BANGALORE-560 008.
फोन सं./Phone No.080 25037171/140
ई-मेल/Email: purchase@lpscb.gov.in



दिनांक/Date: 09.07.2025

लोक निविदा सूचना सं. एल बी2025000196-01 दिनांक 09.07.2025
PUBLIC TENDER NOTICE NO. LB2025000196-01 DATED 09.07.2025

उपसाधनों एवं अतिरिक्त पुर्जों के साथ लघु घूर्णी मैनिपुलेटर की अभिकल्पना, संविरचन, समुच्चयन, परीक्षण एवं आपूर्ति के लिए निविदा।

Tender for Design, fabrication, assembly, testing and supply of small rotary manipulator with accessories and spares

निविदा वर्गीकरण: लोक निविदा
Tender Classification: PUBLIC TENDER

निविदा की निर्धारित तिथियाँ/TENDER SCHEDULE

बोली प्रस्तुति की आरंभिक तिथि/Bid Submission Start Date	: 09.07.2025 16:00
बोली स्पष्टीकरण की नियत तिथि/Bid Clarification Due Date	: 23.07.2025 17:00
बोली प्रस्तुतीकरण की नियत तिथि/Bid Submission Due Date	: 30.07.2025 14:00
बोली खुलने की तिथि/Bid Opening Date	: 30.07.2025 14:30
मूल्य बोली खुलने की तिथि / Price Bid Opening Date	: 08.08.2025 16:00

निविदा दस्तावेज़ <https://www.isro.gov.in/> OR <https://eproc.vssc.gov.in> या इसरो ई-प्रापण पोर्टल से डाउनलोड किए जा सकते हैं।/Tender documents can be downloaded from <https://www.isro.gov.in/> OR <https://eproc.vssc.gov.in> or ISRO E-Procurement Portal.

हस्ताक्षरित/Signed
क्रय व भंडार अधिकारी/Purchase & Stores Officer

**GOVERNMENT OF INDIA
DEPARTMENT OF SPACE
LIQUID PROPULSION SYSTEMS CENTRE (LPSC-B)
BANGALORE**

Tender for Design, fabrication, assembly, testing and supply of small rotary manipulator with accessories and spares for PMSD-LPSCB

Bids to be submitted online

**Tender No.: LPSC-B/Liquid Propulsion Systems Centre,
Bengaluru/LB202500019601 dated 09-07-2025**

A. Tender Details

Tender No :	LPSC-B/Liquid Propulsion Systems Centre, Bengaluru/LB202500019601
Tender Date :	09-07-2025
Tender Classification:	GOODS
Purchase Entity :	Liquid Propulsion Systems Centre, Bengaluru
Centre :	LIQUID PROPULSION SYSTEMS CENTRE (LPSC-B)

Design, fabrication, assembly, testing and supply of small rotary manipulator with accessories and spares for PMSD-LPSCB

Design, fabrication, assembly, testing and supply of small rotary manipulator with accessories and spares for PMSD-LPSCB

A.1 Tender Schedule

Bid Submission Start Date :	09-07-2025 16:00
Bid Clarification Due Date :	23-07-2025 17:00
Bid Submission Due Date :	30-07-2025 14:00
Bid Opening Date :	30-07-2025 14:30
Price Bid Opening Date :	08-08-2025 16:00

B. Tender Attachments

NA

Instructions To Vendors

1. Instructions to Vendors

1. LPSC(B) invites offers through eprocurement portal (<https://eproc.isro.gov.in>) for the supply / service of items as listed in the Tender document.

2. Prospective vendors interested in participating in the tendering process need to get registered in the e-procurement portal by using Digital Signature Certificate. Offers submitted through our online portal only shall be considered and offers received through fax or email or in person shall not be considered.

3. The Tenderers are requested to update their address and contact details, if necessary and submit the Bids online at least two days prior to closing date to avoid last minute system / network related problems. In case of any technical issues, tenderers may write to helpdesk team (eprocure@vssc.gov.in, egps@lpscb.gov.in) for resolution. Request for the extension of the due date for such instances shall not be considered.

4. GST @ 5% is applicable for following goods mentioned under Sl. No. 243B as per Department of Revenue Notification No. 25/2018 - Integrated Tax (Rate) dated 31/12/2018 (Amendment to Notification Nos. 07/2018 dated 25/01/2018 and 01/2017 dated 28/06/2017) and Department of Revenue Notification No. 24/2018 - Central Tax (Rate) dated 31/12/2018 (Amendment to Notification Nos. 06/2018 dated 25/01/2018 and 01/2017 dated 28/06/2017) and Government of Karnataka Notification No. 24/2018 dated 31/12/2018 (Amendment to Notification Nos. 06/2018 dated 25/01/2018 and 01/2017 dated 29/06/2017).

"Scientific and technical instruments, apparatus, equipment, accessories, parts, components, spares, tools, mock ups and modules, raw material and consumables required for Launch Vehicles and Satellites and Payloads"

5. LPSC(B), ISRO is eligible for Customs Duty Concession vide Notification No. 50/2017-Customs dated 30/06/2017 (Sl. No. 539), Notification No. 5/2018-Customs dated 25/01/2018 (Sl. No. 539A) and Notification No. 05/2025-Customs dated 01/02/2025 (Sl. No. 539A). Necessary Customs Duty Concession Certificate shall be provided if applicable.

6. Offer Validity: The offer shall be valid for a period of 90 days (for Single Part Tender) and 120 days (for Two Part Tender) from the date of opening of the tender or any other period as specified in the Tender document. Offers with lesser validity period than that specified are liable for exclusion from the

procurement process.

7. In case of Two Part Tender, Tenderers shall not mention any kind of price element in Techno-Commercial Bid. If any Price element is mentioned in the Techno-Commercial bid, their offer shall be liable for rejection.

8. LPSC(B) reserves the right to accept or reject any quotation in part or in full or part without assigning any reason thereof. LPSC(B) shall be under no obligation to accept the lowest tender and reserves the right to accept whole or any part of the tender or part of the quantity offered and the Tenderers shall supply the same at the rates quoted.

9. Bank Details: Tenderer shall provide their bank details such as IFSC code, IBAN No. , SWIFT etc. along with their offer which shall be not be changed till completion of supply/service.

10. Applicable Law: The Contract shall be governed by Indian Law for the time being in force and jurisdiction shall lie in the Courts of India.

11. Only Class-I and Class-II Local suppliers as per Public Procurement Policy (Preference to Make in India) Order, 2017 are eligible to participate in the bid unless otherwise specified in the Tender document.

12. As far as implementation of Public Procurement Policy (Preference to Make in India) Order, 2017 is concerned, the Office Orders vide No. P-45021/2/2017-B.E-II dated 15/06/2017, which is partially modified by Order No. P-45021/2/2017-PP(BE-II) dated 28/05/2018, Order No. P-45021/2/2017-PP(BE-II) dated 29/05/2019, Order No. P-45021/2/2017-PP (BE-II) dated 04/06/2020 and Order No. P-45021/2/2017-PP (BE-II) dated 16/09/2020 and subsequent Amendments issued by the Department for Promotion of Industries and Internal Trade (DPIIT), Ministry of Commerce and Industry regarding Class-I / Class-II local suppliers, Purchase preference, verification of local contents etc. shall be applicable to this tender unless otherwise specified in the Tender document.

Therefore, bidders may ensure compliance of the same while submitting tenders.

13. Price Preference shall be extended to the MSEs under the Public Procurement Policy for MSEs formulated under the Micro, Small and Medium Enterprises Development Act, 2006 unless otherwise specified in the Tender document. Such MSEs shall produce documentary proof of registration as per provisions of the Policy i.e. registration with District Industries Centre (DIC) or Khadi and Village Industries Commission (KVIC) or Khadi and Industries Board (KVIB) or Coir Board or National Small Industries Commission (NSIC) or Directorate of Handicrafts and Handlooms or Udyog Aadhar Memorandum or any other body specified by Ministry of MSME.

14. As per the Rule 144 (xi) of General Financial Rules,2017, any bidder from a country which shares a land border with India will be eligible to bid in this tender, only if the bidder is registered with the

Competent Authority. Competent Authority for the purpose of registration shall be the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT).

15. Resolution of Disputes: Any dispute, disagreement or question arising out of or relating to or in consequence of the contract or to its fulfillment, or the validity of enforcement thereof which cannot be settled mutually, or the settlement of which is not herein specifically provided for, shall within 30 (thirty) days from the date either party informs the other in writing that such dispute or disagreement exists be referred to arbitration by the sole arbitrator. The Arbitrator shall be appointed as per the Indian Arbitration and Conciliation Act 1996 and proceedings will be conducted in Bangalore. The Arbitration proceedings shall be conducted in accordance with and subject to the Arbitration and Conciliation Act 1996 (Act 26 of 1996) as amended from time to time and the decision of the Arbitrator shall be final and binding on the parties thereto. Each party shall bear its own cost of preparing and presenting its case. The cost of Arbitration including the fees and expenses of the Arbitrator shall be shared equally by the parties unless the award provides otherwise. Subject to provisions of this clause, the courts at Bangalore shall have exclusive jurisdiction. Performance under this Contract shall, however continue during Arbitration proceeding and no payment due or payable by the parties hereto shall be withheld unless any such payment is/or forms a part of the subject matter of the Arbitration proceedings.

16. Force Majeure: Neither party shall bear responsibility for the complete or partial non-performance of any of his obligations if the non-performance results from such force majeure circumstances such as, but not restricted to, flood, fire, earthquake, civil commotion, sabotage, explosion, epidemic, quarantine restriction, strike, lock-out, freight embargo, acts of the Government, acts of public enemy and other acts of God as well as war or revolution, military operation, blockade, acts or actions of State authorities or any other circumstance beyond the control of the parties provided the other party is notified in writing within 21 days from the date of commencement of the unforeseeable event.

2. Local Content Declaration

1. DECLARATION OF LOCAL CONTENT

(To be given on company letter head with self certification - For tender value below Rs. 10 Crores

(To be given by Statutory Auditor or Cost Auditor or Cost Accountant or CA - For tender value above Rs. 10 Crores)

Date:

To,

Sub: Declaration of Local content

Tender Ref No:

Name of Tender:

1. Country of Origin of Goods being offered:

2. We hereby declare that items offered has -----% local content:

3. Details of Local Value additions:

4. Address At which Local value addition is being made:

"Local Content" means the amount of value added in India which shall, be the total value of the item being offered minus the value of the imported content in the item (including all customs duties) as a proportion of the total value, in percent.

It is certified that the above mentioned Local content is excluding the following (a) (b) & (c):

- a. Imported items sourced locally from resellers/distributors are excluded from calculation of the above local content.
- b. The license fees/royalties paid/ technical charges paid out of India shall be excluded from local content calculation.
- c. Procurement/Supply of repackaged/refurbished/rebranded imported products as understood commonly shall be treated as reselling of imported products and shall be excluded from calculation of local content. The definition of repackaged /refurbished/rebranded imported products is as follows; Refurbishing means repair or reconditioning of an imported product does not amount to manufacture because no new goods come into existence. Repackaging means repacking of imported goods from bulk pack to smaller packs would not ordinarily amount to manufacture of a new item. Rebranding means relabeling or renaming or change in symbol or logo/makes or corporate image of a company/organization/ firm for an imported product would amount to rebranding.

It is certified that as per DPIITs OM Ref P-45021/102/2019-BE-II-Paart(1)(E-50310) Dtd. 04/03/2021 the local content mentioned above, by which we are Class-I local suppliers / Class-II local suppliers, does not contain services such as transportation, insurance, installation, commissioning, training and after sales service support like AMC / value addition.

"False declaration will be in breach of Code of Integrity under Rule175(1)(i)(h)of the General Financial Rules 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."

Yours faithfully,

(Signature of the Bidder/OEM with Official seal)

C. Bid Templates

C.1 Technical Bid - Design, fabrication, assembly, testing and supply of small rotary manipulator with accessories and spares for PMSD-LPSCB

1. EQUIPMENT

Design, fabrication, testing and supply of Rotary Manipulator as per attached Annexure

Item specifications for EQUIPMENT

Design, fabrication, testing and supply of Rotary Manipulator as per attached Annexure

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Design, fabrication, testing and supply of Rotary Manipulator as per attached Annexure	As per the annexure	Yes / No / Explain		

Document : Annexure for Design, fabrication, testing and supply of Rotary Manipulator

2. EQUIPMENT

Design, fabrication and supply of three types of functional test adaptor for the requirements as per attached Annexure (total: 6 nos-2 nos of each type)

Item specifications for EQUIPMENT

Design, fabrication and supply of three types of functional test adaptor for the requirements as per attached Annexure (total: 6 nos-2 nos of each type)

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Design, fabrication and supply of three types of functional test adaptor for the requirements as per attached Annexure II (total: 6 nos-2 nos of each type)	Design, fabrication and supply of three types of functional test adaptor for the requirements as per attached Annexure II (total: 6 nos-2 nos of each type)	Yes / No / Explain		

Document : Annexure for Design, fabrication and supply of three types of functional test adaptor

Common Specifications (Applicable for all items)

SI No	Specification	Value	Compliance	Offered Specification	Remark
1	Design, fabrication, testing and supply of Rotary Manipulator as per attached Annexure	Design, fabrication, testing and supply of Rotary Manipulator as per attached Annexure	Yes / No / Explain		
2	Design, fabrication and supply of three types of functional test adaptor for the requirements as per attached Annexure II (total: 6 nos-2 nos of each type)	Design, fabrication and supply of three types of functional test adaptor for the requirements as per attached Annexure II (total: 6 nos-2 nos of each type)	Yes / No / Explain		

Supporting Documents required from Vendor

1. Detailed compliance matrix for each specification with supporting details/catalog etc.

5 additional documents can be uploaded by the vendor

C.2 Commercial Terms / Bid

Sl. No.	Description	Compliance	Vendor Terms
1	As per the scope of work attached	Yes / No / Explain	
2	This is a Two Part Tender. Do not mention price element in Techno Commercial Bid. If any price element mentioned in technical bid, your offer will not be considered.	Yes / No / Explain	
3	Goods and Services Tax (GST): Kindly mention percentage of GST considered in your offer along with HSN Code.	-	
4	Delivery Terms: FOR LPSC, Bangalore.	Yes / No / Explain	
5	Delivery Period: Design and drawing approval - within two months of PO Placement. Delivery of rotary manipulator, functional test adaptor and other accessories - within eight months of design and drawing clearance.	Yes / No / Explain	
6	Payment Terms: 100% payment shall be made within 30 days of receipt and acceptance of the items at our site.	Yes / No / Explain	
7	Liquidated Damages (LD): If the ordered items are not supplied within the delivery schedule, LD shall be levied from your bill @ 0.5% of the order value per week or 0.5% of the value of the stores for which the delivery is delayed for each week of delay subject to a maximum of 5% of the order value. However, in case of inordinate delay in completion period, LD @ 10% shall be recovered.	Yes / No / Explain	
8	Warranty: The items shall be warranted for a minimum period of 12 months from the date of supply or acceptance of items at our site which ever is later. Necessary warranty certificate shall be furnished along with the supply.	Yes / No / Explain	

9	Performance Bank Guarantee (PBG): You have to submit PBG towards fulfilment of warranty obligations and performance of the system for 3% of the Order Value from a Nationalized / Scheduled Bank on non-judicial stamp paper of appropriate value valid till the completion of warranty period plus 60 days as per the format provided by Department.	Yes / No / Explain	
10	Security Deposit (SD): You have to furnish a Bank Guarantee from a Nationalized / Scheduled Bank on non-judicial stamp paper of appropriate value for 3% of the order value within 10 days of receipt of order towards the faithful execution of the order valid till the completion of the scope of work as per order plus sixty days (as claim period). SD shall only be applicable for order value above INR 50.00 Lakhs. SD shall be returned to you immediately on execution of the order satisfactorily as per order terms. In case of non-performance / poor performance, the amount shall be withheld.	Yes / No / Explain	
11	SD cum PBG: In case, if parties are unable to provide two separate BGs, i.e. one for SD and one for PBG, they can submit a combined BG for SD & PBG within 10 days of receipt of order for 3% of order value valid till the completion of total contractual obligation (i.e. supply period plus warranty period plus 60 days) as per the format provided by the Department.	Yes / No / Explain	
12	Insurance: Being a Government of India Department, Insurance is not required at our cost. Please ensure the safe delivery of the ordered item with proper AIR / SEA / ROAD worthy packing.	Yes / No / Explain	
13	Free Issue Material (FIM), if applicable: You have to submit Bank Guarantee for a value equivalent to FIM (if applicable) from a Nationalized / Scheduled Bank on non-judicial stamp paper of appropriate value towards issue of FIM. The BG shall be valid till receipt and acceptance of supply and satisfactory accounting of FIM.	Yes / No / Explain	
14	Address, contact details like Telephone Number, e-mail, etc. on which order to be placed.	Yes / No / Explain	

15	Details of Principal: Address, contact details like Telephone Number, e-mail, etc. (if applicable)	Yes / No / Explain	
16	Bank Details: Bank name, Branch address, Account No., IFSC Code, IBAN Number, SWIFT, etc.	Yes / No / Explain	
17	Local Content (%): Please mention the percentage of Local Content and the location where local value addition takes place (Kindly enclose self-certification document in the prescribed format)	Yes / No / Explain	
18	MSE Status: Kindly mention the classification under MSE and submit supporting documentation (if applicable)	Yes / No / Explain	
19	Validity of offer: 120 days from the date of opening of tender or as specified in the Tender Document.	Yes / No / Explain	
20	The party should provide comprehensive training to LPSC employees in the functioning as applicable to specific testing requirements.	Yes / No / Explain	
21	Any other terms	Yes / No / Explain	

C.3 Price Bid

Sl. No.	Item	Quantity	Unit Price	Currency	Total Price	Remark
1	EQUIPMENT Design, fabrication, testing and supply of Rotary Manipulator as per attached Annexure	1.00 Sets		-		
2	EQUIPMENT Design, fabrication and supply of three types of functional test adaptor for the requirements as per attached Annexure (total: 6 nos-2 nos of each type)	1.00 Sets		-		

Common charges (Applicable for all items)

P & F Charges	
Freight if any (Value)	
Installation & Configuration	
Other Costs, if any (Value)	
Taxes, if any (Percentage)	

Specification for design, fabrication, assembly, testing and supply of small rotary manipulators with accessories and spares

Generic Specification for Small Rotary Manipulator – Annexure I

Sl. No.:	Parameter	Specification
1.0	Scope of Work	
1.1		Party has to design the rotary manipulator and submit the design report for approval.
1.2		Party has to generate 3D model of rotary manipulator and submit it for approval.
1.3		Party has to generate 2D working drawings and submit it for approval.
1.4		All design parameters and drawings to be approved by LPSC.
		Material of construction should be structural steel as per IS 2062.
1.5		Fabrication of rotary manipulator as per the approved drawings.
1.6		Standard fabrication procedures to be adopted.
1.7		Machining of part with standard tolerance and accuracy.
1.8		For procurement of bought out items if required details such as item specification, make and quantity to be intimated.
1.9		Integration of all machined parts and bought out items.
1.10		Electrical systems and logic integration to achieve smooth rotations in both axes to specified RPM and logics.
1.11		Performance test for smooth operation without load.
1.12		Load test with maximum load of 500 kg and maximum deflection to be within allowed limit for both vertically down and horizontal direction. Necessary dummy load for load test with interface to be supplied by the vendor.
1.13		Painting, finishing and stickering to get aesthetic look. Colour to be approved by LPSC.
1.14		Delivery at LPSC site campus after final testing and approval by LPSC.
1.15	Design, fabrication and supply of three types of functional test adaptor for the requirements as per attached Annexure II (2 nos. of each type)	Party has to design functional test adaptor to suit rotary manipulator at one end and test article at other end through bolted interface and submit the design report for approval.
1.16		Party has to generate 3D model of functional test adaptor and submit it for approval.
1.17		Party has to generate 2D working drawings and submit it for approval.

Sl. No.:	Parameter	Specification
1.18		All design parameters and drawings to be approved by LPSC.
1.19		Material of construction should be SS304.
1.20		Fabrication of functional test adaptor as per the approved drawings.
1.21		Standard fabrication procedures to be adopted.
1.22		Machining of part with standard tolerance and accuracy.
1.23		All welding should be 100% TIG welding, including secondary passes.
1.24		All weld joints are to be 100% X-ray graphed as per ASME standard. The welding should be carried out by qualified welders only.
1.25		Quality plan detailing the dimensional report, dye penetrant process document with necessary inspection check points and evaluation procedure for X-ray radiography of welds, confirming to ASME standards should be supplied to LPSC for approval.
1.26		The materials used for functional test adaptor shall be analyzed for chemical and mechanical properties at Govt. approved testing agencies and the same has to conform to the specification requirement.
1.27		No paint should be used on the functional test adaptor.
1.28		All bolts, nuts should be of SS304 which is used for locking functional test adaptor to rotary manipulator. One set of spare bolts, nuts and washers per test adaptor should be supplied along with the adaptor. The party should supply the test certificate for all the fasteners.
2.0	Functional Test Adaptor Interface	
2.1	Mounting Interface -1 as per the requirements of figure 1 in Annexure III	Plate type interface
		18 nos. M5 Equi-spaced on Φ 214 ± 0.2 PCD
		Maximum mass – 70 kg
		Liquid mass during rotation – Will vary from 1 kg to 60 kg
2.2	Mounting Interface - 2 as per the requirements of figure	Plate type interface
		8 nos. M6 Equi-spaced on Φ 120 ± 0.2 PCD

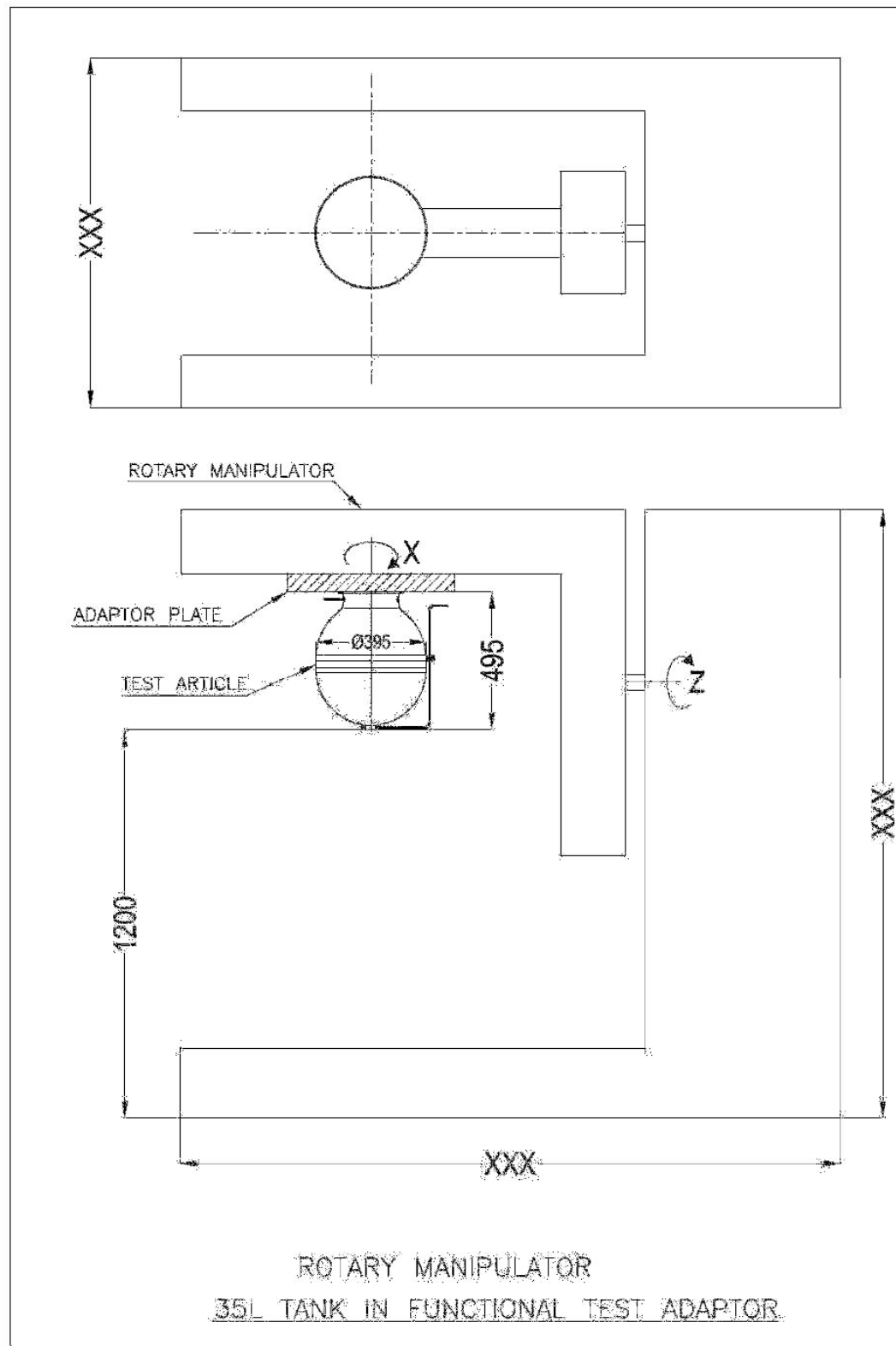
Sl. No.:	Parameter	Specification
	2 in Annexure III	Maximum mass – 250 kg
		Liquid mass during rotation – Will vary from 10 kg to 200 kg
2.3	Mounting Interface -3 as per the requirements of figure 3 in Annexure III	Cuboid structure with plate type interface
		8 nos. M8 Equi-spaced on $\Phi 150^{+0.1}$ PCD
		Maximum mass – 40 kg
		Liquid mass during rotation – Will vary from 1 kg to 10 kg
2.5	Condition during rotation	The fill fraction during rotation may vary from 10% at lower end to 100% at upper end.
3.0	Technical Specifications	
3.1	Rotation	2 axis motorized rotations, separate / simultaneous
3.2	Tilting range	$\pm 360^\circ$ in both the axes
3.3	Maximum payload at 90° tilt	250 kg
3.4	Tilting function	Discreet / Continuous rotation
3.5	Maximum tilting speed	5 RPM, Default - 1 RPM
3.6	Variable speed	0.5 – 5 RPM (stepless)
3.7	Overall length	2200 mm
3.8	Overall width	1000 mm
3.9	Table run-out at periphery	± 0.1 mm
3.10	Table run-out at face	± 0.1 mm
3.11	Rotation speed accuracy	$\pm 1\%$
3.12	Minimum attainable rotational speed without jerking and tripping of drives	0.5 RPM
3.13	Maximum rotational speed	5 RPM
3.14	Positional accuracy	$\pm 0.1^\circ$
3.15	Table rotation	Table rotation shall be by worm gear boxes and necessary pre-loaded secondary worm gear boxes to ensure minimum

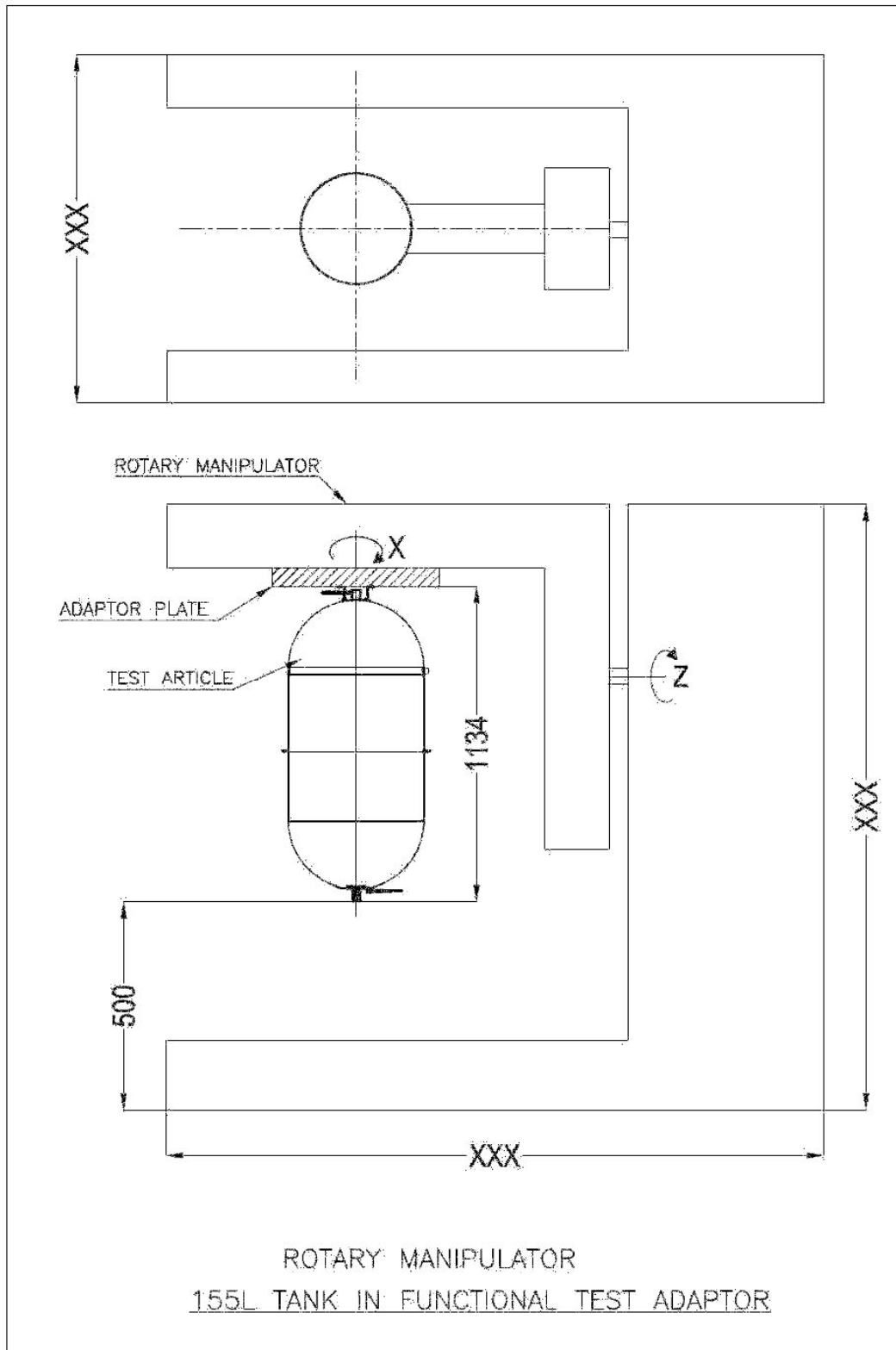
Sl. No.:	Parameter	Specification
		backlash. Table should be designed to achieve angular play not more than of 0.3 mm over a diameter of 1000 mm in vertical position with load.
3.16	Maximum swing diameter	1800 mm
3.17	Supply voltage	415 V \pm 10 %, 3 Phase / 50 Hz
3.18	Maximum ambient temperature	50 °C
3.19	Maximum humidity	90 %
3.20	Table to be equipped with efficient built is earthing	> 600 A
3.21	To eliminate possible overrun of tilt gears	Limit switches are to be provided in software as well as hardware
3.22	Feedback system	Feedback system for angular position and speed of table rotation shall be interfaced to the controller.
3.23	Load capacity chart	For COG and eccentricity
3.24	Main control panel	Main control panel should have VFD with EMI filters and to work with both STAR & DELTA connections, PLC with in-built protections for motor like O/C start fail prolonged start, phase fail single phase preventer and phase sequence, isolators, overloading relays, voltmeter, ammeter, frequency meter, PF meter, power & control contactors, rotary switches, timers, selector switches, limit switch controls, safety interlock switches, illuminated push buttons, by-pass contactors, alarm trip, toggle switches etc. required for smooth and logics controlled operations.
3.25	Manual remote pendant	Remote control panel should have ON/OFF and selection controls for both motors and HMI with display systems. Pin type lockable plug and sockets at main supply input point, drive output point, control output point and remote panel output point areas.
3.26		Dust tight remote-control pendant
3.27		Switch for table rotation in clockwise and anti-clockwise direction
3.28		Switch for tilting forward / reverse of positioner
3.29		Emergency stop switch interfaced with automation controller

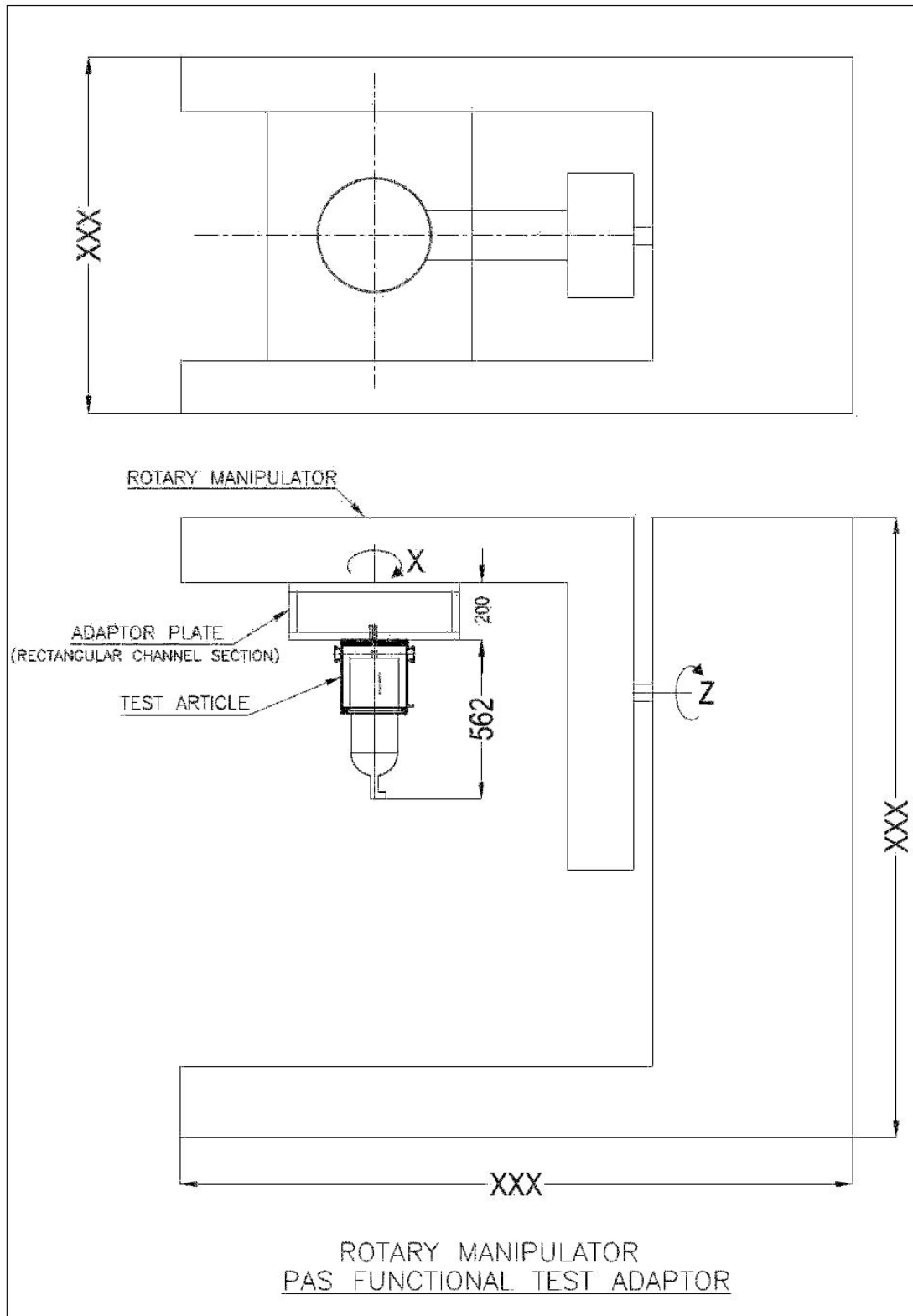
Sl. No.:	Parameter	Specification
3.30		Shall work in controller on/off condition
3.31	Motor control	Interface for remote control through DAS should be provided
4.0	Power Supply	
4.1	50Hz – 240/415V A/C – Three phase – 4 Wire	
5.0	Environmental Requirements	
5.1	The unit shall be capable of being stored continuously in ambient temperature of 10 – 50 °C and relative humidity of 15-90%	
5.2	The unit shall be capable of operating in ambient temperature of 10 – 50 °C and relative humidity of 90%	
6.0	Safety Requirements	
6.1	Electrical safety as per CE standard or equivalent.	
6.2	All electrical items to conform to IP54 & EN 60529 or equivalent.	
6.3	Braking provision in case of abrupt failure through self-locking motor, self-locking gear and thread self-locking	
6.4	Provision for manual override through external shaft with detachable handle.	
7.0	Quality / Certification Requirements	
7.1	Load test certificate	
7.2	Certification for the material used	
7.3	Certificate of conformity for purchase components	
7.4	Process & planning manual	
7.5	Floor inspection reports for all manufacturing items	
7.6	Trial run summary report	
7.7	X-ray report of functional test adaptor welds	
7.8	Chemical composition certificate for functional test adaptor material	
7.9	Mechanical properties certificate for functional test adaptor material	
8.0	Documentation	

Sl. No.:	Parameter	Specification
8.1	User/Technical/Maintenance manuals to be supplied in English	
8.2	Comprehensive Manufacturer warranty for a period of 1 year	
9.0	Delivery period	
9.1	Design and drawing approval – Within two months of PO placement	
9.2	Delivery of rotary manipulator, functional test adaptor and other accessories – Within eight months of design and drawing clearance	
10.0	Factory acceptance testing [FAT]	
10.1	Load test with maximum load of 500 kg and maximum deflection to be within allowed limit for both vertically downward and horizontal condition.	
10.2	FAT shall be carried out at vendor's premises in the presence of LPSC engineers /representatives. Vendor shall provide advance intimation to LPSC at least one week in advance towards readiness for FAT to verify the functionality of rotary manipulator under all rotation conditions.	
11.0	Spare parts	
11.1	Essential spare parts such as rotary encoder, circuit breakers, contactors, relays, actuators, bolts, nuts, washers etc. should be clearly highlighted and its location clearly indicated in the maintenance drawing.	
11.2	Two sets of all the essential spare parts to be supplied along with the unit.	

Annexure II – Rotary Manipulator Conceptual Sketch







Annexure III – Interface Definitions

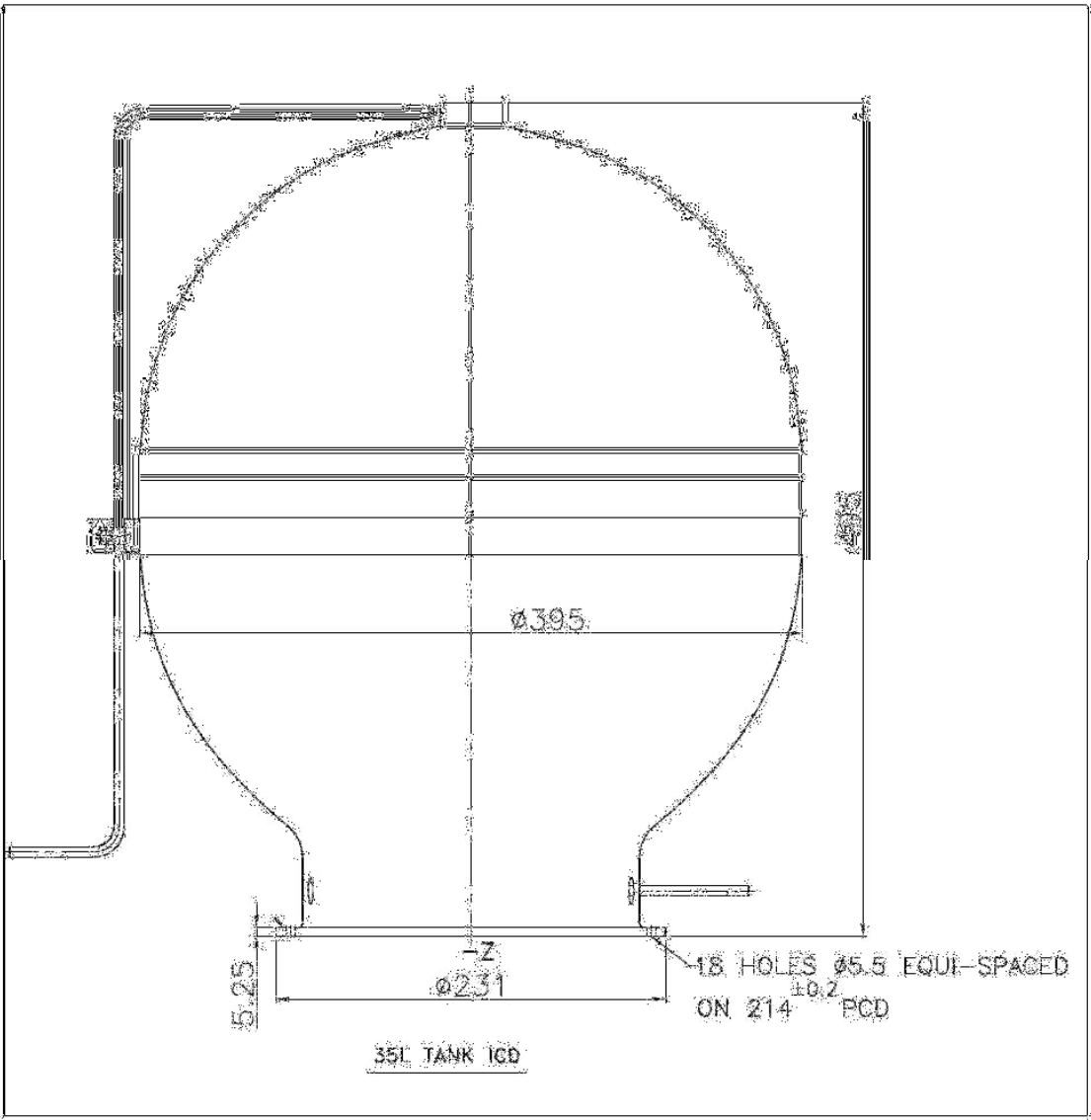


Figure 1

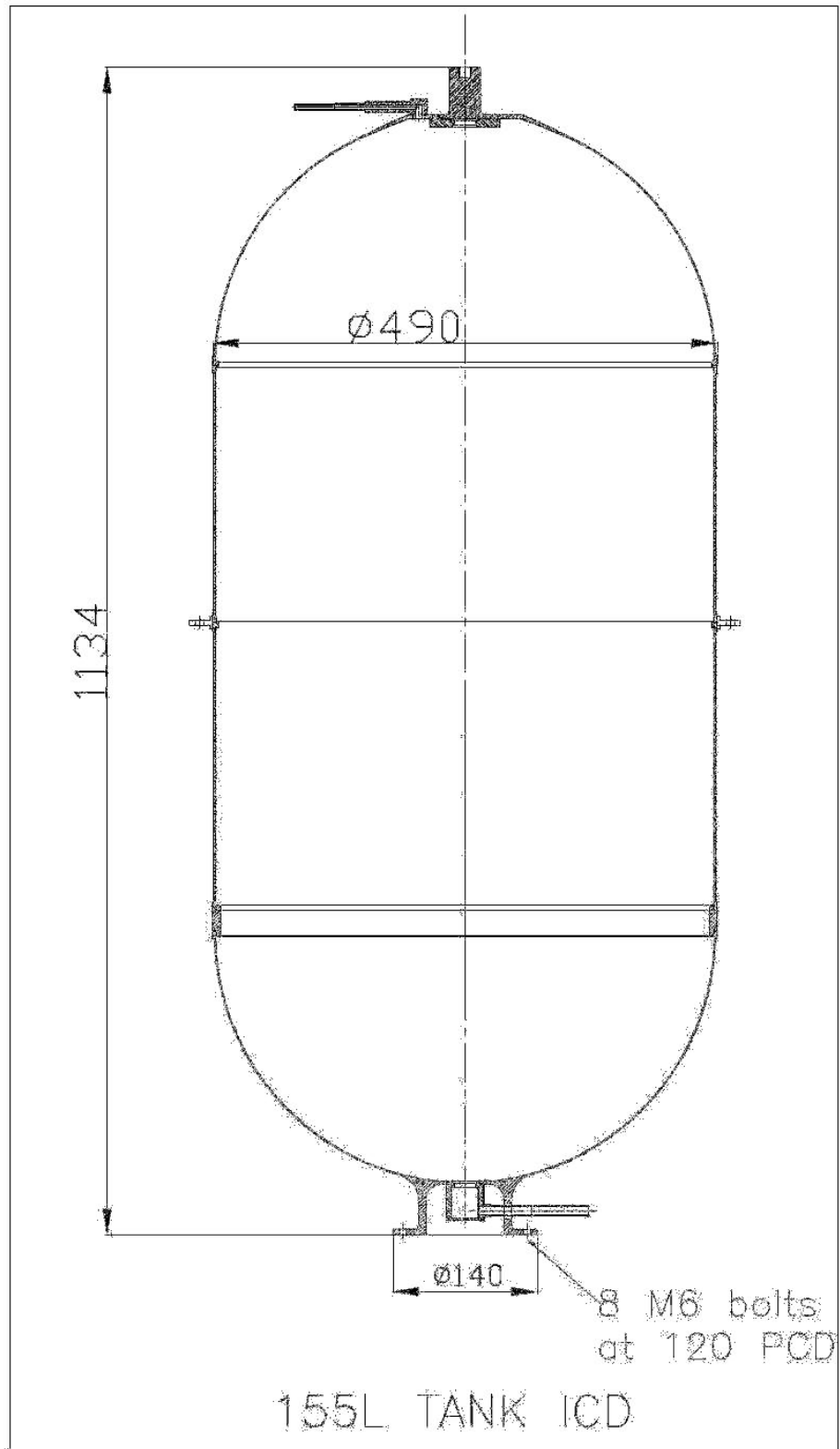


Figure 2

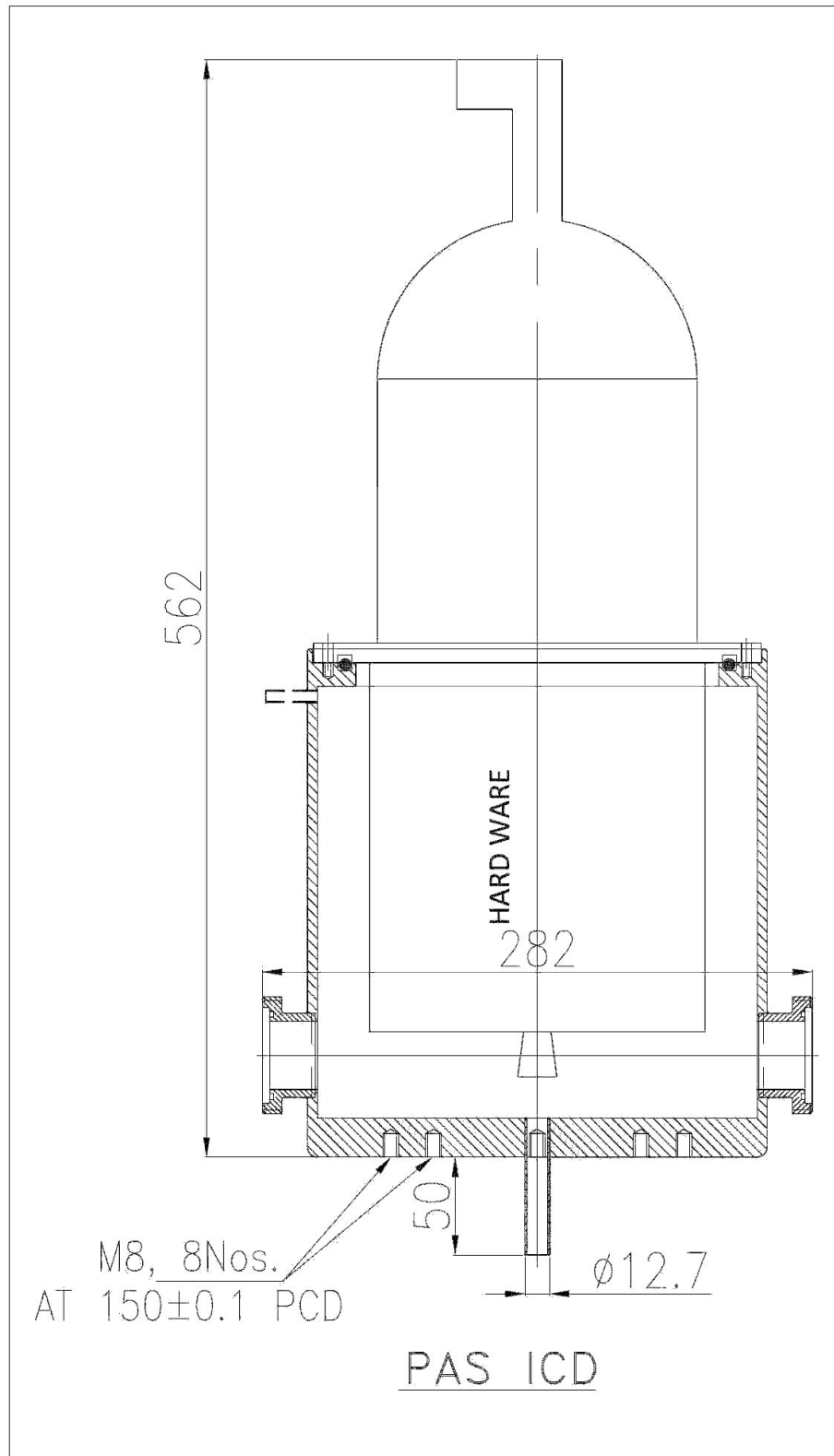


Figure 3

Annexure – IV
General Conditions

1. You should scrutinize the drawing and study the feasibility for design and fabrication before quoting.
2. You should submit the design details and fabrication drawings to LPSC for approval. Any change required should be intimated to LPSC for prior approval.
3. Only reputed brands of motor to be used such as NORD, SEW etc. for ensuring fail safe smooth operations under full load conditions.
4. Party should send representative for installation & demonstration working.
5. The Party should provide comprehensive training to LPSC employees in the functioning as applicable to specific testing requirements.
6. The Party should provide operational manual and maintenance manual in English.
7. Comprehensive manufacturer warranty of one year to be provided.
8. Detailed compliance matrix is to be provided compulsorily for each and every point with proof through documentation.
9. The Party should provide a list of essential spares with break-up cost for each item for trouble-free operation for duration of 5 years.
10. You have to submit a time schedule showing the break-up of activities for realization of the tanks.
11. The party should submit monthly reports to maintain the progress of fabrication as per schedule.
12. The readiness of the rotary manipulator to be informed to LPSC so that LPSC representatives shall witness the load test at your works and clear the system after other tests before dispatch. All inspection reports related to manipulator should be submitted during the test to enable our engineers for giving dispatch clearance.