

COEP Technological University
(COEP Tech)

A Unitary Public University of Government of Maharashtra

w.e.f 21st June 2022

(Formerly College of Engineering Pune)

INVITATION OF E-TENDER

For

Making of the prototype for the operational Turret Mechanism

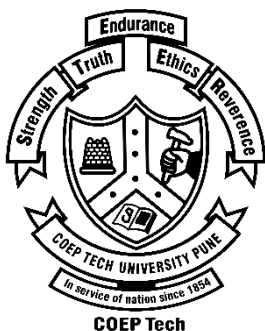
Reference No: COEP/MECH/ARMREB/SSO/ 1465

Date:18/10/2025

Cost of document Rs. 5700 INR (Non-refundable)

Telephone Number: 020 2550 7918/ 7946

Website: <https://mahatenders.gov.in>



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(Formerly College of Engineering Pune)

Wellesley Rd, Shivajinagar, Pune-411 005. Maharashtra, INDIA.

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Department of Mechanical Engineering

Reference No: COEP/MECH/ARMREB/SSO/1465

Date: 18/10/2025

INVITATION OF E-TENDER

About the Work:

COEP Technological University invites digitally sealed quotations for “Making of the prototype for operational Turret Mechanism” through the e-Procurement System of the Government of Maharashtra (<https://mahatenders.gov.in/>) as per **Part 1: Technical Bid (Appendix-A & Annexure-I, II, III, IV) and Part 2: Commercial Bid (Appendix-B) in the prescribed Bid forms.**

Digitally sealed bids are invited for “Making of the prototype for operational Turret Mechanism” as per the Annexure – I: Manufacturing of the prototype of turret mechanism, Annexure – II: Components of the prototype of turret mechanism, Annexure – III: Drawings of the prototype of turret mechanism, Annexure – IV: Instructions to the vendors about scope of the total work as mentioned in **Part 1: Technical Bid**

The work details are available in the tender document, which can be downloaded from the eProcurement system of the Government of Maharashtra (<https://mahatenders.gov.in/>). A bid is to be submitted online only through the e-Procurement system of the Government of Maharashtra (<https://mahatenders.gov.in/>) up to the last date and time of the tender submission.

Sr. No.	Details	Remarks
1	Online Tender No and Date	Ref. No.: COEP/MECH/ARMREB/SSO/1465 Date: 18/10/2025
2	Issue of online Tender forms	18/10/2025 to 12/11/2025
3	Last date of submission of online Tenders	12/11/2025 by 17:00 Hours
4	Pre Bid Meeting	4/11/2025 at 4.30 pm at Room No. 106, New Bajaj Building, Mechanical Department, COEP Technological university Pune
5	Opening of online Tenders	13/11/2025 at 15:00 hours
6	Online Tender Fees	Rs. 5,700/- (Rupees Five Thousand Seven Hundred Only) (Non-Refundable) Online submission on www.mahatenders.gov.in
7	Bid Security/EMD:	Rs.95,000/- (Rupees Ninety Five Thousand only) online submission. Refund (a) To the unsuccessful tenderer within 30 days after the expiry of the validity date of the tender. (b) To the successful tenderer, after submission of full security deposit or made part of Security Deposit

8	Performance Security Deposit / Bank Guarantee:	Performance Security Deposit / Bank Guarantee (Nationalized Bank only) for an amount @ 3% value of the contract (if order is placed) is to be submitted immediately after accepting the purchase order. The performance security must be valid during the warranty period i.e. for Three Years. The same will be returned without any interest after completion of warranty and support period.
9	Correspondence Address	Mechanical Engineering Department, COEP Technological University, Pune, Wellesley Road, Shivajinagar, Pune 411005

Client/ Owner (COEP Tech) representative: Dr. S. S. Ohol, Principal Investigator, Department of Mechanical Engineering, COEP Technological University , Pune – 411005
Phone - (O) 020-25507918/ 7946 and Email – sso.mech@coeptech.ac.in

Registrar

COEP, Technological University Pune

Date: 18/10/2025

1. Eligibility Criteria:

- The vendor/firm/company should be OEM and must have experience in manufacturing similar systems (Total cost Rs 10 lakhs) in the last five years from the date of publishing of this tender. The bidder should submit the supporting documents such as purchase order, work completion order, appraisals, ... etc.
- The bidder should be registered under the Establishment Act/ Companies Act.
- The bidder must be registered under GST Registration.
- The bidder should have a valid Permanent Account Number (PAN) allotted to the firm/company/proprietor/agency.
- The Bidder shall be possessing experience similar system. A copy of a valid Authorization letter from the concerned reputed manufacturers is required.

Tenders of a bidder/firm/company with inadequate/irrelevant details (failing to fulfill the details above) are liable for rejection. The bidding vendor/firm/company should submit supporting documents online (<https://mahatenders.gov.in/>) in this regard.

Supporting Documents for Submission towards Pre-Qualification / Eligibility Criteria details:

Sr. No.	Pre-Qualification Criteria	Supporting Documents to be enclosed with the Bid
1	The bidder shall be a Private Limited or Limited Company registered under the Indian Companies Act 1956 or 2013 of GOI and should be in existence in India for the last 5 years as on the day of bidding. Consortium / Joint venture bid not allowed. Proprietorship/Partnership firms are not allowed to participate	Copy of relevant Certificates along with ● Certificate of Incorporation ● GST Registration certificate ● PAN card
2	The Bidder/ Technical person must have experience of at least 5 years in the relevant field of providing similar systems.	Copies of relevant work order (s) with completion certificate required
3	The Bidder should have duly filed Income Tax Returns & other applicable Govt. /Statutory body Taxes for the FY 2024-25	Relevant Documents
4	The Prime bidder including the consortium members shall not be under a declaration of ineligibility for corrupt or fraudulent practices or blacklisted with any of the Government agencies.	Self-Certification
5	Bidders must submit 100% Technical Compliance	Technical Compliance certificate must be on OEM Letterhead signed by concerned authority.
6	3 Years Warranty Undertaking document	3 Years Warranty Undertaking must be provided from the Bidder/ OEM letterhead signed by concerned authority

2. Online Bidding Process through the eProcurement system of the Government of Maharashtra (<https://mahatenders.gov.in/>):

A Bid / Tender document will be in two-cover systems - Technical Bid (Part 1) and Commercial Bid (Part 2).

Part 1: Technical Bid – A detailed profile of the Organization/firm/company, eligibility for selection, tender terms & conditions, etc. – are to be submitted in a separate sealed cover. This should include documents in support of the experience, list of similar works carried out, client list, Pre-Qualification / Eligibility Criteria, Appendix-A.

Part 2: Commercial Bid - As per the tender, a commercial bid should be indicated in Indian rupees (in figures as well as in words). The final offer given by the bidder shall be with respect to the complete cost of the project (Appendix B).

3. Submission of Tender Documents online through the eProcurement system of the Government of Maharashtra (<https://mahatenders.gov.in/>)

3.1 Format & signing of Bid Document:

A Bid / Tender document shall be submitted in the prescribed format.

Bids must be accompanied by:

The guidelines to download the tender document, online submission of bids, and procedure of tender opening can be downloaded from the website <https://mahatenders.gov.in/>.

The date & time of online submission shall strictly apply to all cases. The bidders should ensure that their tender is prepared and submitted online before the expiry of the scheduled date & time. Offers not submitted online within the stipulated time will not be entertained.

If for any reason, any interested bidder fails to complete any of the online stages during the complete tender cycle, the institute will not be responsible and any grievance regarding the same shall not be entertained.

Instruction for submitting bids online through the eProcurement system of the Government of Maharashtra (<https://mahatenders.gov.in/>) are as given below:

3.1.1 Part 1: Technical Bid – In the prescribed format sealed and duly signed

Part1: shall contain the following:

1. EMD of Rs.95,000/- to be submitted online through the eProcurement system of the Government of Maharashtra.
2. Details of bidder's experience and capabilities in the given format with specifications of product required (Appendix –A), Balance sheets / audited accounts for the past three years.
3. Details of Turret System Mechanism as per Annexure I, Annexure II, Annexure III and Annexure IV.

3.1.2 Part 2: Commercial Bid – In the prescribed format sealed and duly signed (Appendix-B)

Bidders shall submit their online commercial offers only in the eProcurement system of the Government of Maharashtra in the prescribed format. The price quoted elsewhere shall be liable for rejection.

4. Acceptance of Tender conditions:

- 4.1 The last date for an online submission of a tender document is 12/11/2025 before 17:00 hrs. Bids received online beyond the closing date / time will not be accepted and will be rejected, unopened. Bid(s) received after the last date of bid submission will be rejected.
- 4.2 Part 1 (Technical Bid) will be opened on 13/11/2025 at 15:00 hrs. at the COEP Technological University, Pune in the presence of the bidder's representatives willing to attend. In the event of any change in the date of opening, the same will be intimated to all concerned.
- 4.3 Part 2 (Commercial Bid) will be opened only after a technical evaluation of the tenders and only eligible and technically qualified bidders will be invited for a commercial bid opening activity at the same venue in the presence of the bidders' representatives willing to attend. The date of the opening of commercial bids will be intimated to only eligible and technically qualified bidders. In the event of any change in the date of opening, the same will be intimated to all.
5. The incomplete tenders will be rejected without any consideration.
6. An authorized person shall sign the tender and his / her full name and status be indicated below the signature along with an official stamp of the vendor/firm/company.
7. The Vice-Chancellor, COEP Technological University, Shivajinagar, Pune reserves the right to amend or withdraw any of the terms and conditions mentioned in the tender document or reject any or all the tenders without giving any notice or assigning any reason and is not bound to accept the lowest

tender. The decision of the Vice-Chancellor, COEP Technological University, Shivajinagar in this regard shall be final and binding to all.

- 8. Performance Security Deposit / Bank Guarantee:** A Performance Security Deposit / Bank Guarantee (nationalized bank only) for an amount @ 3% value of the total cost (if the order is placed) is to be submitted immediately after accepting a purchase /work order. The performance security must be valid for a period of the warranty duration. The same will be returned without any interest after the completion of the warranty period.
- 9.Verification of Bank Guarantees:** The Bank Guarantee submitted by the bidder as Performance Security is subject to verification from the issuing bank by the purchaser before its acceptance.
- 10.** The vendors shall have to provide a quote for all the items of the tender. Part Tenders/incomplete Tenders shall be summarily rejected.
- 11.** Offers in the bid should be written in English and price(s) should be written in figures as well as words in Indian Rupee.
- 12.** Relevant supporting document(s) should be enclosed along with the offer.
- 13.** No bid will be entertained by E-mail / FAX.
- 14.** The Institute reserves the right to accept or reject any bids and to annul the bidding process and reject all bids at any time prior to the award of a contract, without there by incurring any liability to the affected bidder or bidders or any obligation to inform the affected bidder.

Appendix-A (to be filled by bidder)

Part 1: Technical Bid:

“Making of the prototype for operational Turret Mechanism” as per the Annexure – I: Manufacturing of the prototype of turret mechanism, Annexure – II: Components of the prototype of turret mechanism, Annexure – III: Drawings of the prototype of turret mechanism, Annexure – IV: Instructions to the vendors about the scope of the total work

FORMAT & REQUIREMENTS

1. Tender Ref. No:
2. Name of the Firm/Company/Vendor/Bidder/:
3. Complete office address of Firm/Company /Vendor/Bidder
4. Contact details of an authorized person of the Firm/Company /Vendor/Bidder who has signed the tender.
 - a. Name.....
 - b. Designation.....
 - c. Phone (Office).....
 - d. Phone (Mobile).....
 - e. E mail.....
5. Due date & Time of submission of the bid:
Tender fee & EMD with online details & bank details.....
6. Submission of technical confirmation to the requirement.
7. Higher technical specifications may be considered, subject to competitive price offers.
8. Documents to be enclosed with the Technical bid are as given below:
Duly signed & stamped Tender documents (All pages) as a mark of your acceptance.

Sr. No.	Pre-Qualification Criteria	Supporting Compliance document	Compliance (Yes/No)
1	The bidder shall be a Private Limited or Limited Company registered under the Indian Companies Act 1956 or 2013 of GOI and should be in existence in India for the last 5 years as on the day of bidding. Consortium / Joint venture bid not allowed. Proprietorship/Partnership firms are not allowed to participate	Copy of relevant Certificates along with ● Certificate of Incorporation ● GST Registration certificate ● PAN card	
2	The Bidder/ Technical person must have experience of at least 5 years in the relevant field of providing similar systems.	Copies of relevant work order (s) with completion certificate required	
3	The Bidder should have duly filed Income Tax Returns and other applicable Govt. /Statutory body Taxes for the FY 2024-25	Relevant Documents	
4	The Prime bidder including the consortium members shall not be under a declaration of ineligibility for corrupt or fraudulent practices or blacklisted with any of the Government agencies.	Self-Certification	
5	Bidders must submit 100% Technical Compliance	Technical Compliance certificate must be on OEM Letterhead signed by concerned authority.	
6	3 Years Warranty Undertaking document	3 Years Warranty Undertaking must be provided from the Bidder/ OEM letterhead signed by concerned authority	

Seal and signature of the Manager /Representative of the firm
on behalf of the firm submitting the Tender
Telephone:.....Mobile:.....
Fax:.....E-mail:.....
Contact Person Name:.....
Designation:.....

Annexures (I, II, III & IV)

Detailed Technical Specifications for Making of the prototype for the operational Turret Mechanism:

1. General

1. Vendors should provide Compliance statement (with proof marked/ highlighted in the datasheet) along with technical bid. If compliance statement is not provided or not properly filled, it will be considered that the vendor does not meet specifications.
2. Warranty: Three years from the date of satisfactory commissioning for Hardware, Mechanical, Electrical and Electronic components.
3. Manuals: A set of system operating manuals should be supplied

Tender Specification Document

Operational requirement	• To provide Traverse angle & Elevation angle positioning to the turret mechanism with suitable remote control operating mechanism. • The Mechanism shall consist of mechanical elements + motorised control system for movement control of Traverse & Elevation angle. • The system should accommodate LMG – 7.62 mm Caliber weapon for trials testing in dry and actual test.
	The Set up to be provided with suitable control system to demonstrate the working of Traverse and Elevation movements at the desired location as per the requirement of the project.

Annexure – I

Manufacturing of the system -

Sr. No.	Manufacturing	Qty	Specifications
1	Traverse Mechanism with Base Mount Motion Range = 0^0 To 360^0 (as per CAD drawing attached)	1	The Traverse mechanism should be a Geared dynamic tracking system with suitable Indexing arrangement to provide Traverse positioning. A Gear Box coupled with PMSM motor to impart the Traverse positioning movement. External Encoder to be provided for feedback of Traverse Angle. A limit switch to detect the extreme left/right positions & Mechanical brake for emergency lock, power off condition and long positional hold without power. The Traverse Mechanism to be rigid in construction to support the mounting arrangement for the elevation mechanism. Suitable sheet metal guards / covers should be provided The set up will be powder coated. Material: Stainless Steel (e.g ASTM A36 Steel)
2	Elevation mechanism. Motion Range = -20^0 To $+80^0$ (as per CAD drawing attached)	1	The mechanism will be rigid enough to withstand the forces generated during firing of Small Arm Weapons. A Gear Box + PMSM motor + External Encoder + Limit Switch to be provided to impart the elevation angle to the Weapon system. The feedback for Elevation angle is to be taken from External Encoder. A limit switch to detect the extreme up/down positions (-20 to $+80$ degrees) & Mechanical brake for emergency lock, power off condition and long positional hold without power. A Cradle arrangement to hold the Small Arm Weapon to be provided. Weapon for Caliber 7.62 to be held in the arrangement and a trigger

	Weapon Mounting cradle with a Solenoid for firing.		operating mechanism with electrical solenoid to operate the trigger as per the command from the control system. The weapon mounting cradle to be provided with compression springs to minimise the backward movement due to recoil forces. The spring can be adjusted / changed to get suitable dampening for recoil. Suitable sheet metal guards / covers will be provided. The set up will be powder coated. Material: Stainless Steel (e.g ASTM A36 Steel)
3	Tripod Table	1	Designed with 3 equally spaced legs at 120° angles for symmetrical load distribution. Fully welded structure with additional bracing for enhanced stiffness and vibration resistance. Designed to support static and dynamic load of turret assembly during operation. Material: Stainless Steel (e.g ASTM A36 Steel) OR A readily available adjustable tripod from market for weight carrying capacity of 200 kg.
4	Worktable for the control & display unit	1	The cabinet is designed to organize essential electronics and control systems including a laptop, controller, power supplies, and motor drivers. The unit includes caster wheels for easy movement, and multiple front-mounted power sockets for flexible connectivity and integration.

Annexure – II

Components of the system -

Sr. No.	Element	Qty	Specifications
1	Gear Box	2	60:1 Worm gearbox as per the supplier, design of system and compatible with the azimuth and elevation motors. Output shaft: Flanged Type, mounting orientation: Angled, with high self-locking capability & smooth operation (eg, NMRV Series Worm Gearbox)
2	Motor with Brake (Azimuth Motor)	1	Permanent Magnet Synchronous Motor (PMSM) with constraints 4 Nm, 2200 rpm (eg. Kollmorgen/MOOG Motor) Motor compatible with 230 AC supply
3	Motor with Brake (Elevation Motor)	1	Permanent Magnet Synchronous Motor (PMSM) with constraints 8.20 Nm, 2000 rpm (eg. Kollmorgen/MOOG Motor) Motor compatible with 230 AC supply
4	Drives (Azimuth Drive)	1	Compatible with Azimuth motor (eg. Kollmorgen/MOOG Drive) and inbuilt internal power supply. Drives compatible with 230 AC supply
5	Drives (Elevation Drive)	1	Compatible with Elevation motor (eg. Kollmorgen/MOOG Drive)) and inbuilt internal power supply. Drives compatible with 230 AC supply.
6	Power Supply	1	60 Volts/30 amps, compact size, latest version programmable power supply
7	Microprocessor-Developer kit	1	384-core (e.g.- NVIDIA Volta™) GPU with 48 Tensor Cores, 21 TOPS, 6-core (e.g.- NVIDIA Carmel ARM®v8.2) 64-bit CPU16 GB eMMC 5.1
8	Limit Switch	4	Roller lever, rated voltage 24 VDC, 5-10 A, Operating temperature: –25°C to +70°C
9	External Encoder for motor position	2	Resolution: 14-bit single-turn (16,384 steps/rev), 12-bit multi-turn (4096 revs), Supply voltage: 18–30 V DC, Blind hollow shaft 10 mm, Max operating speed: 6000 rpm
10	Microcontroller with power supply	1	A 32-bit programmable microcontroller designed for motor control applications, supporting advanced control algorithms such as Field-Oriented Control (FOC), PID, Fuzzy Logic, Model Predictive Control (MPC), Sliding Mode Control (SMC), Active Disturbance Rejection Control (ADRC), Neural Networks, and Feedforward control.

			The microcontroller must also provide compatibility with MATLAB for modelling, simulation, and implementation of the above-mentioned algorithms (MPC, SMC, PID, Fuzzy, FOC).
11	Deep Groove Ball Bearing	4	Single Row Deep Groove Ball Bearing- Open Type (e.g SKF 6005)
12	Slew Ring bearing	1	OD = 260 mm, ID = 132 mm, external bolt circle = 240 mm, internal bolt circle = 160 mm, 12 holes, bolt hole dia. = 11 (for example Kavitsu slewing bearing)
13	Control Display Unit	1	Laptop Fully Rugged MIL-STD 810H, 6 feet operating drop rating, IP66 certified and optional salt fog resistant Intel® Core™ i5-1250P vPro® Processor, Max. 4.4GHz with Intel® Turbo Boost Technology - 12MB Intel® Smart Cache, GTX1650 4GB discrete graphics controller, 8GB DDR4 RAM, 512 GB SSD (eg, Panasonic, Dell, etc)
14	Drone	1	Range: 1 Km, Payload = 2 to 4 kg
15	Lidar	1	2D Lidar, 360 degrees, laser range finder 12 m
16	Inclinometer	1	3D Digital Compass inclinometer Sensor SEC385 Accuracy 0.5° Digital Output RS485 RS232 TTL, serial interface
17	Dummy guns	1	Paintball gun with a laser
18	Linear Solenoid actuator	1	Linear actuation for triggering of the weapon for the actual LMG Model.
19	Electrical & Electronics Accessories	10	Required accessories for system prototype – eg, Power distribution boards, MCB, power supply wires, etc

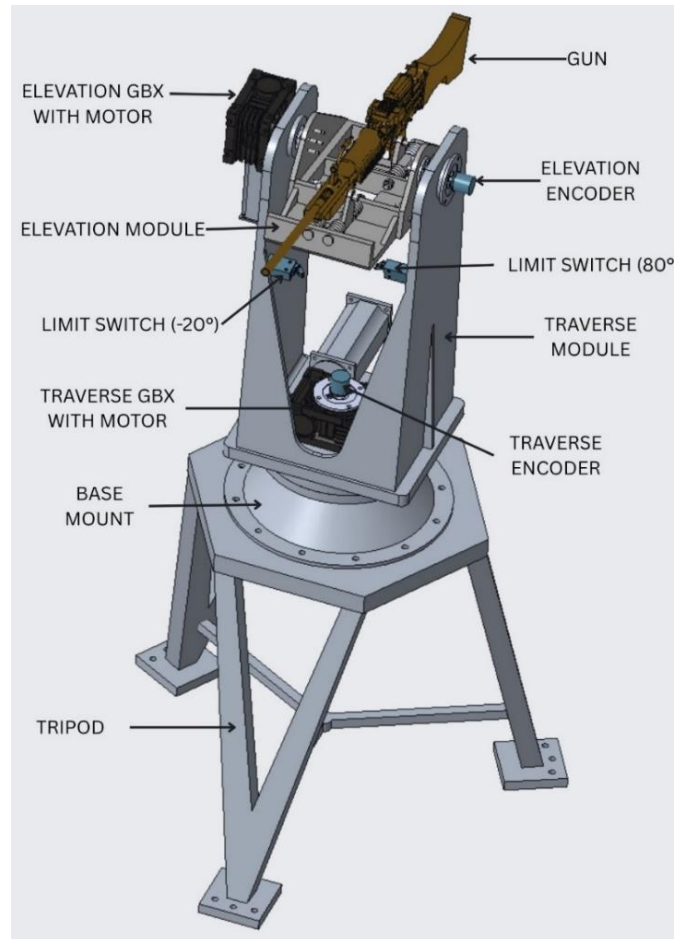
Annexure – III

Drawings of the prototype of turret mechanism

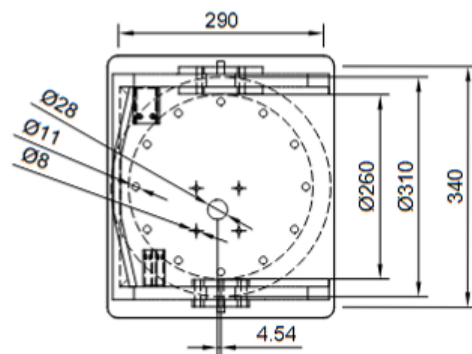
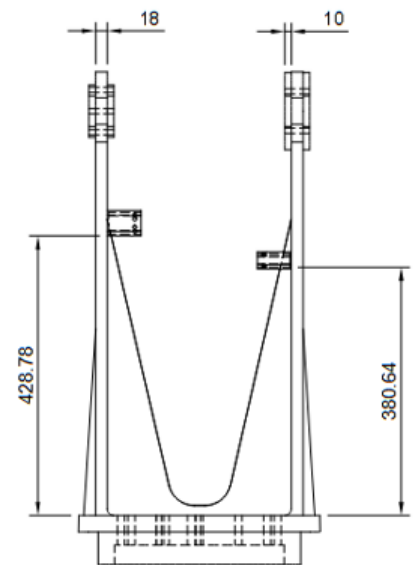
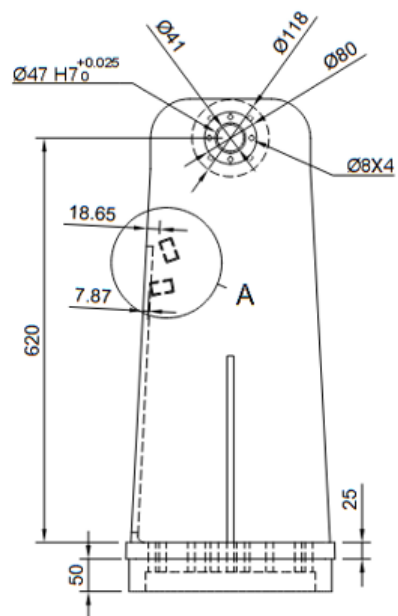
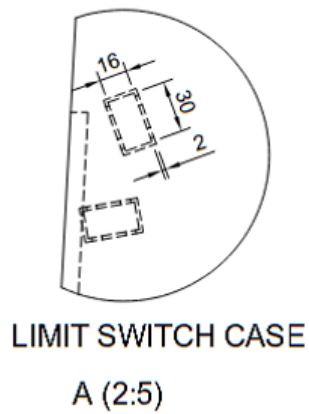
• Tolerances & Surface Finish

Sr. No.	Part Name	Feature Type	Symbol	Nominal Size (mm)	Tolerance Grade	Upper Limit (mm)	Flatness (mm)	Other Geometric Tolerance (mm)
1	Traverse	Hole (ø8)	∅	8	H9	0.043	–	–
		Hole (ø11)	∅	11	H13	0.27	–	–
		Hole (ø41)	∅	41	H7	0.035	–	–
		Hole (ø47)	∅	47	H7	0.04	–	–
		Hole (ø80)	∅	80	H7	0.046	–	–
		Surface (Flat)	□	–	–	–	–	–
2	Tripod Table	Hole (ø12)	∅	12	H9	0.043	–	–
		Hole (ø296)	∅	296	H7	0.04	–	–
		Surface (Flat)	□	–	–	–	0.2	–
3	Base	Hole (ø10)	∅	10	H9	0.027	–	–
		Hole (ø290)	∅	290	H11	0.16	–	–
		PCD (ø97.5)	∅	97.5	–	–	–	–
		PCD (ø125)	∅	125	–	–	–	–
		PCD (ø260)	∅	260	–	–	–	–
4	Elevation Base	Hole (ø6)	∅	6	H9	0.027	–	Position 0.1
		Hole (ø10)	∅	10	H9	0.027	–	Position 0.1
		Surface (Flat)	□	–	–	–	0.2	Parallelism 0.1
5	Shaft	Shaft (ø25 g6)	∅	25	G6	-0.007	0.8	-
		Flange (ø30)	∅	30	-	-	1.6	-
		Flange (ø60)	∅	60	-	-	1.6	-
		Hole (ø6)	∅	6	-	-	1.6	-

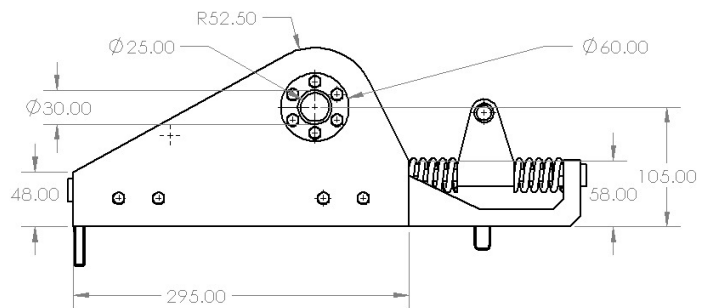
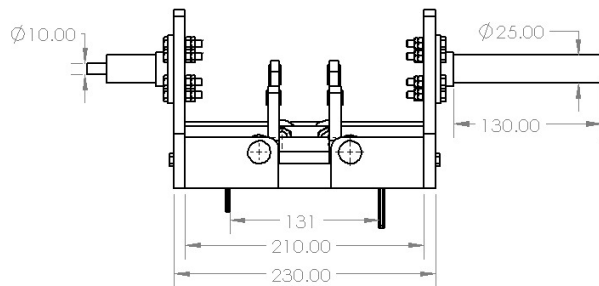
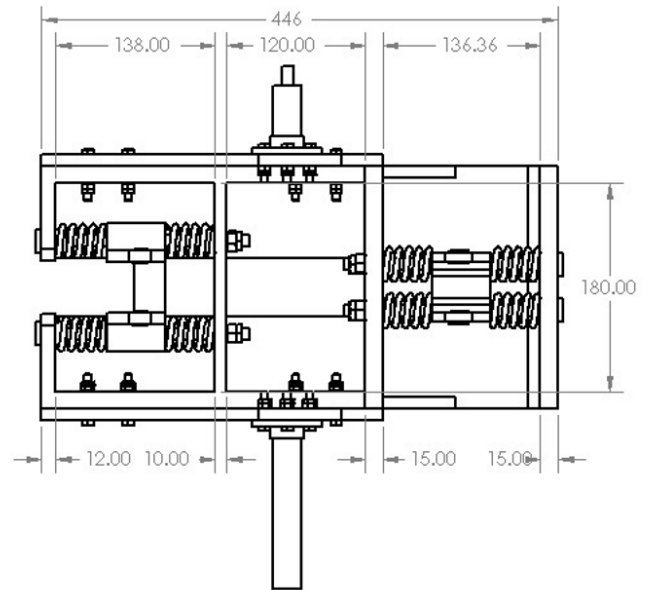
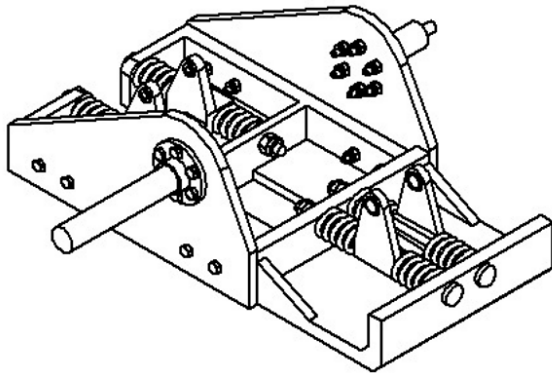
- CAD Drawings:



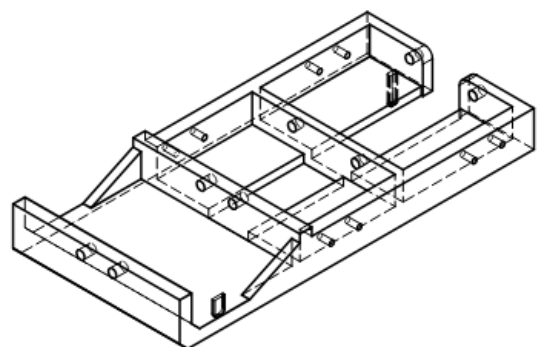
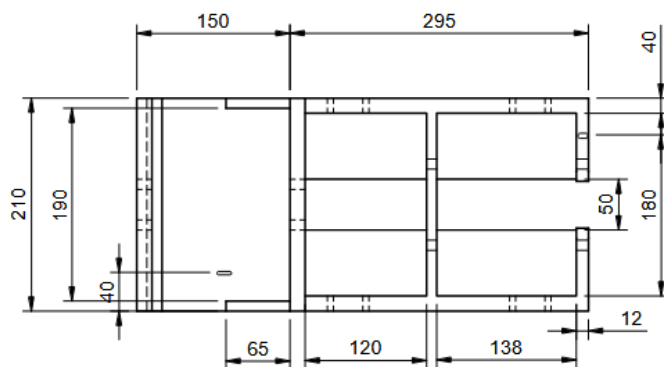
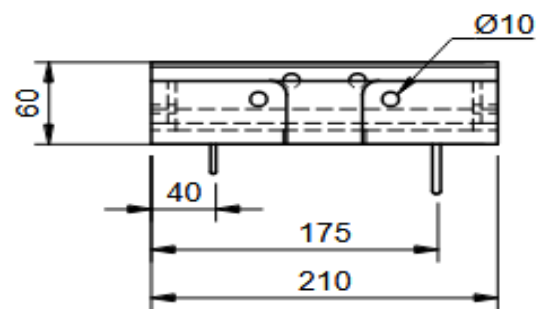
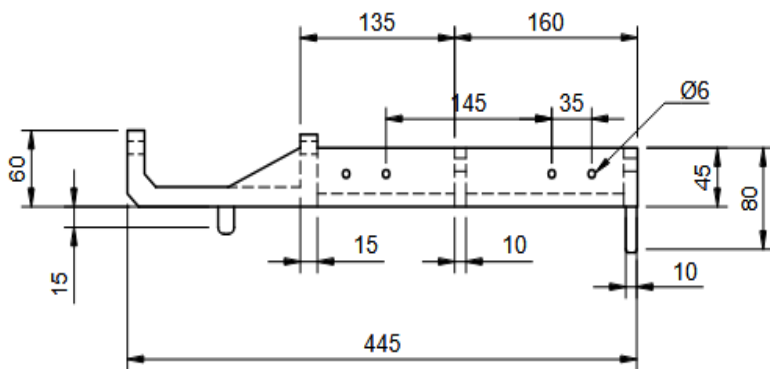
1. Traverse Module



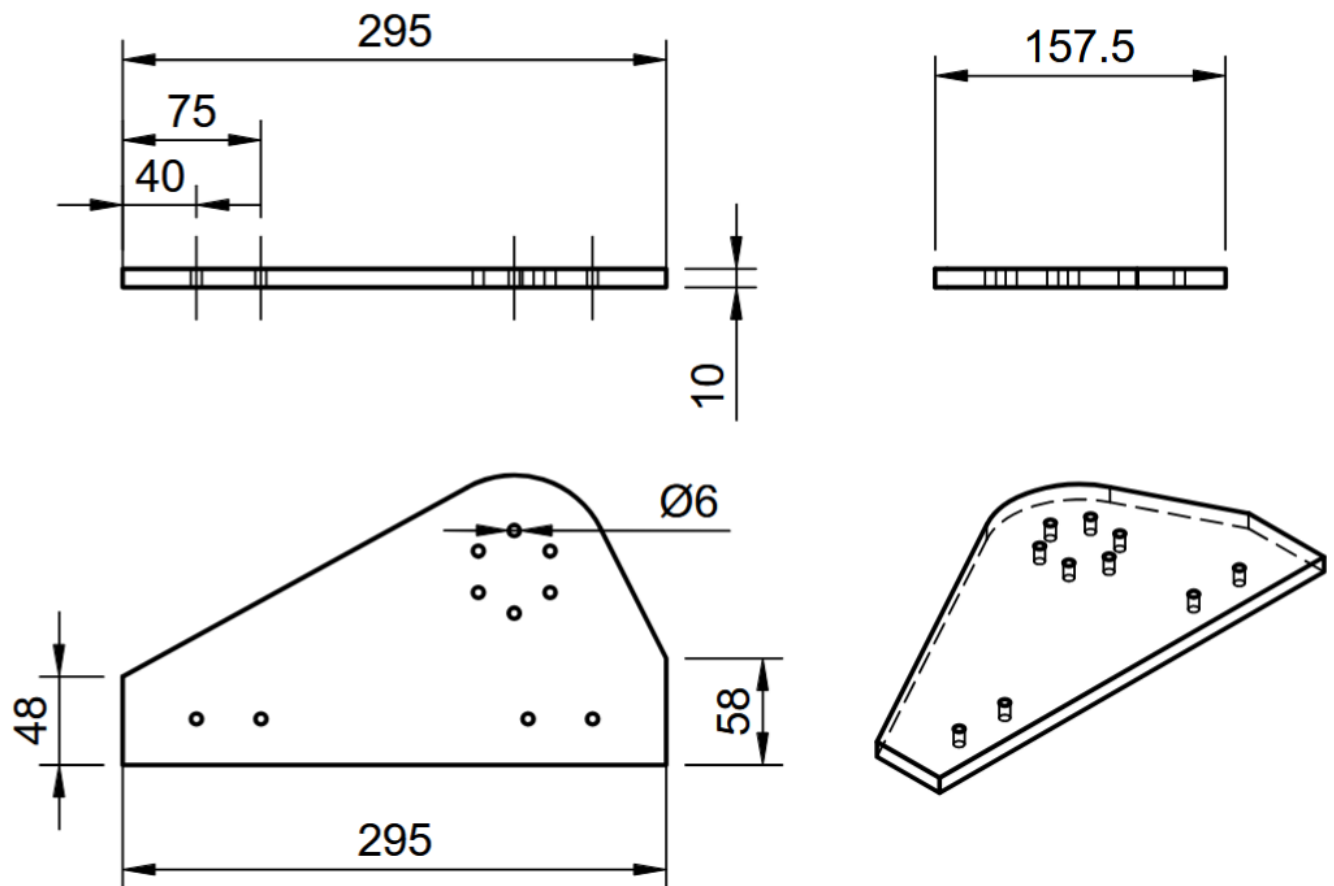
2. Elevation Module



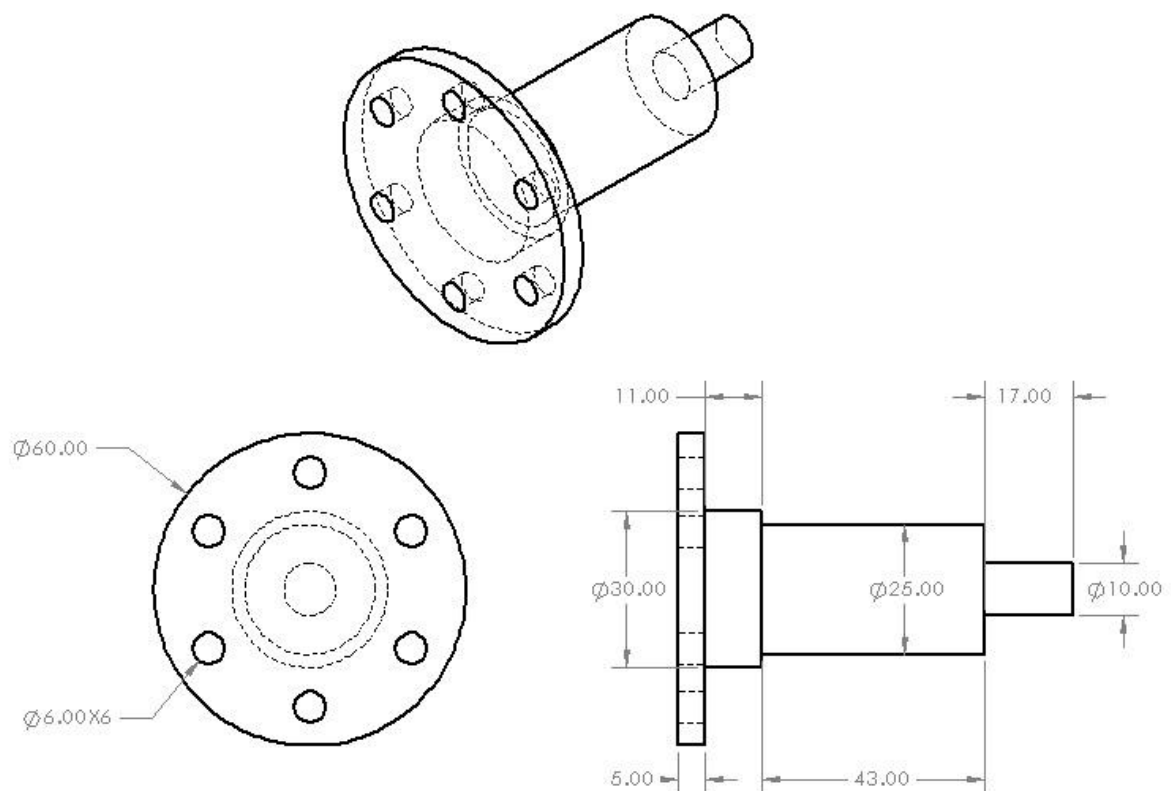
a. Elevation Base



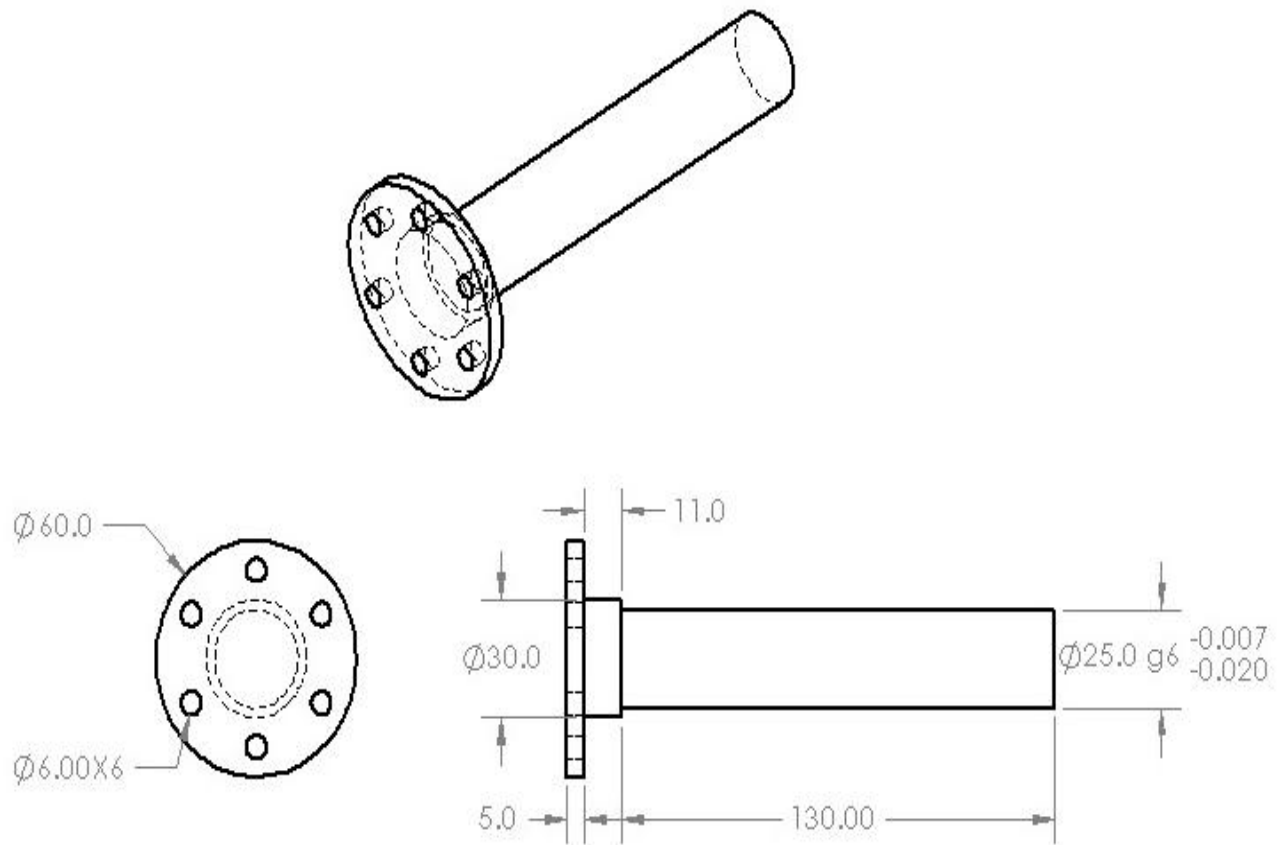
b. Side Flange



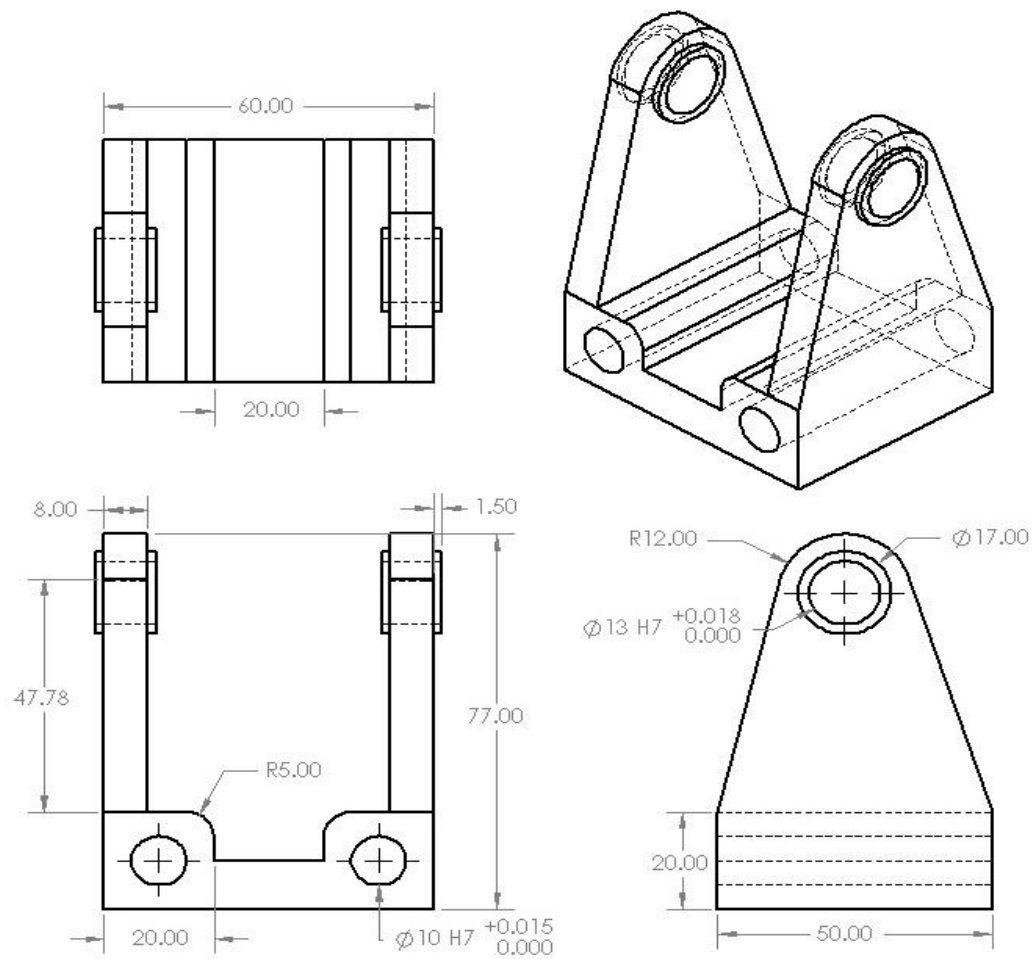
c. Flange at Encoder end



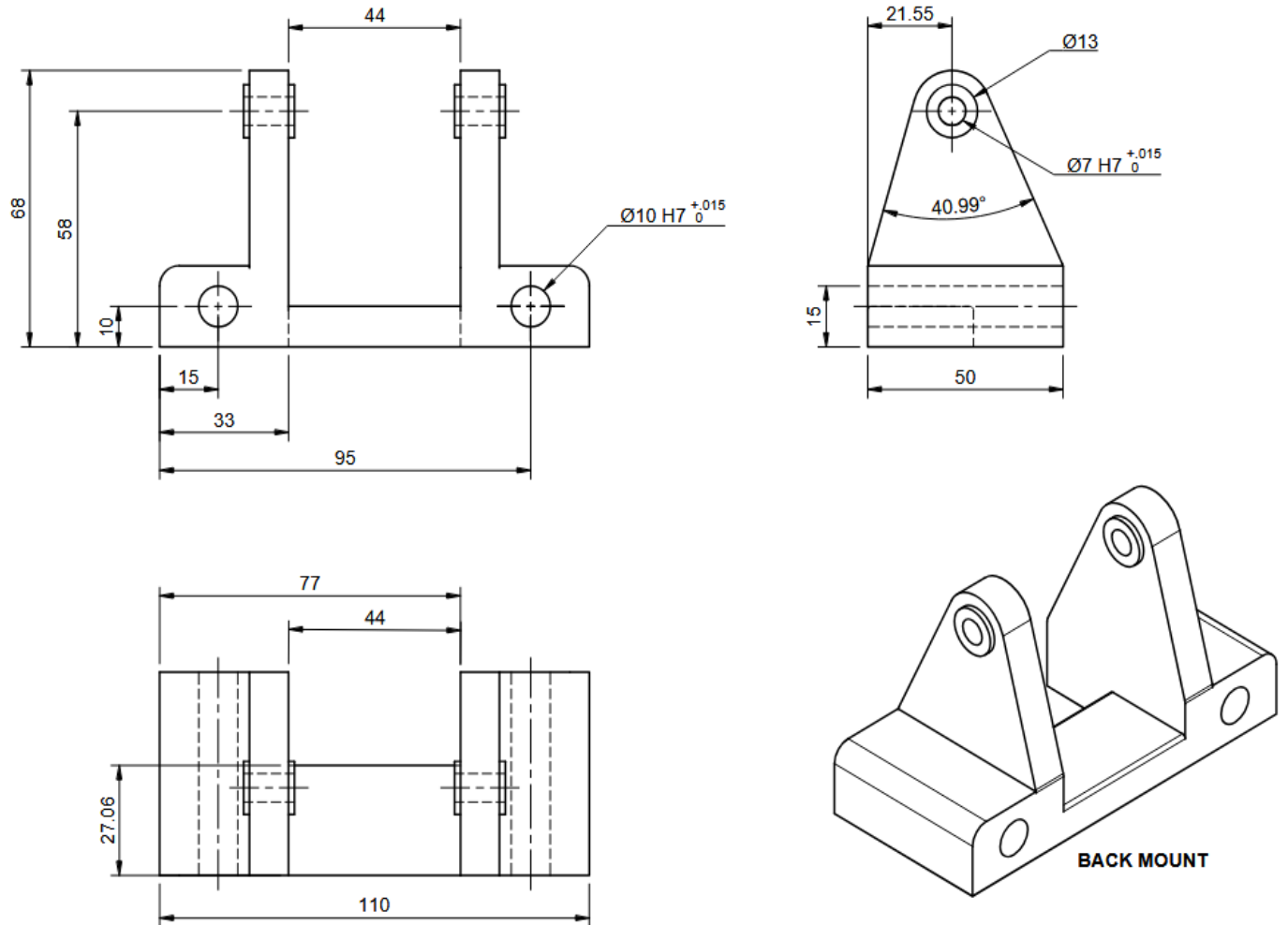
d. Flange at Gearbox end



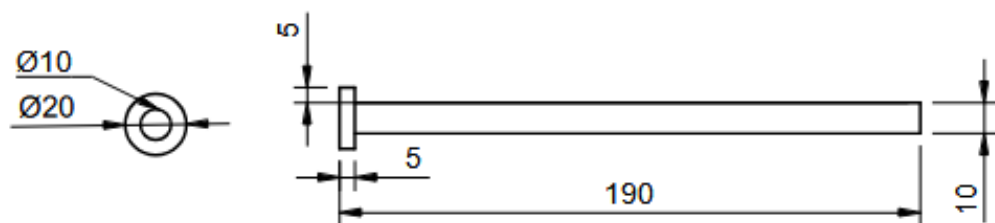
e. Front Holder



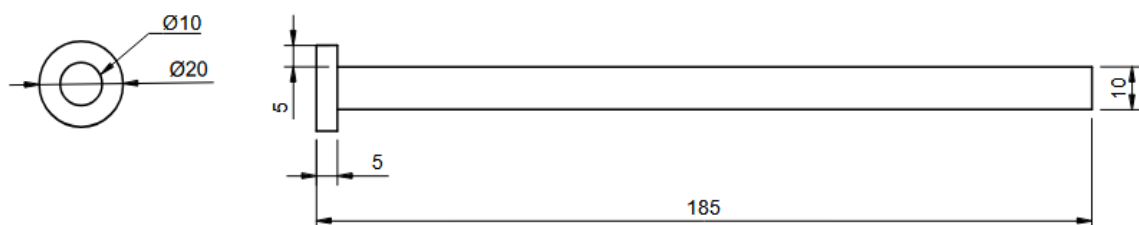
f. Back Mount Holder



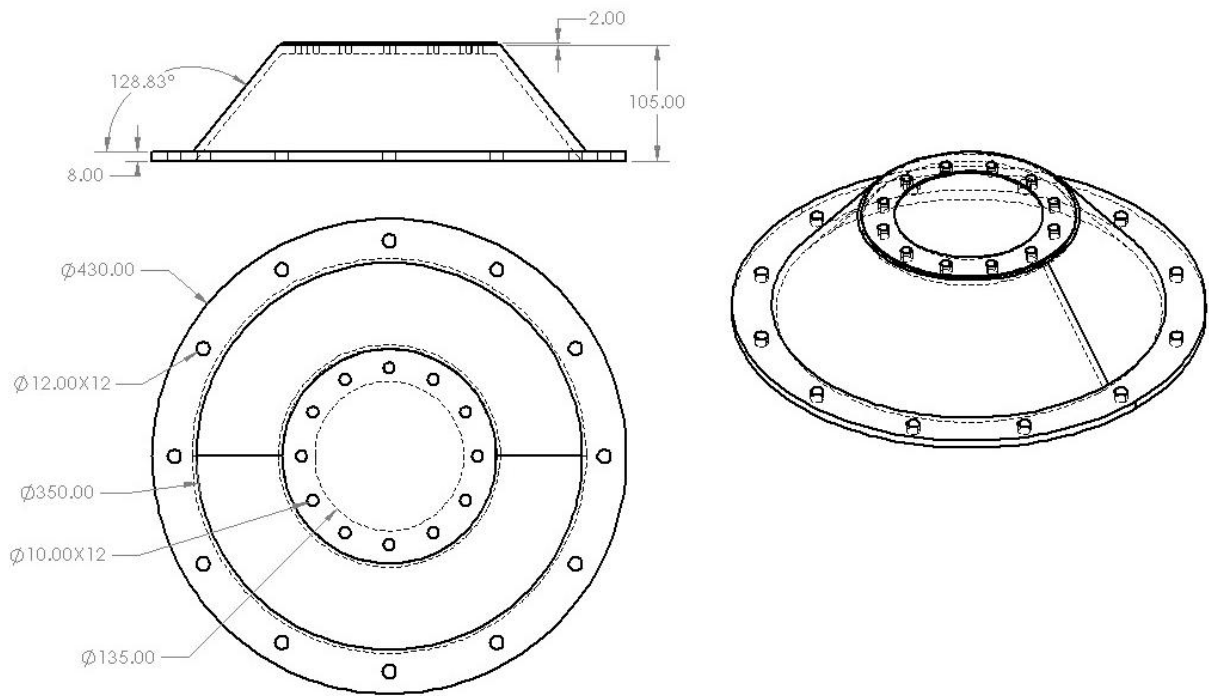
g. Front Rod



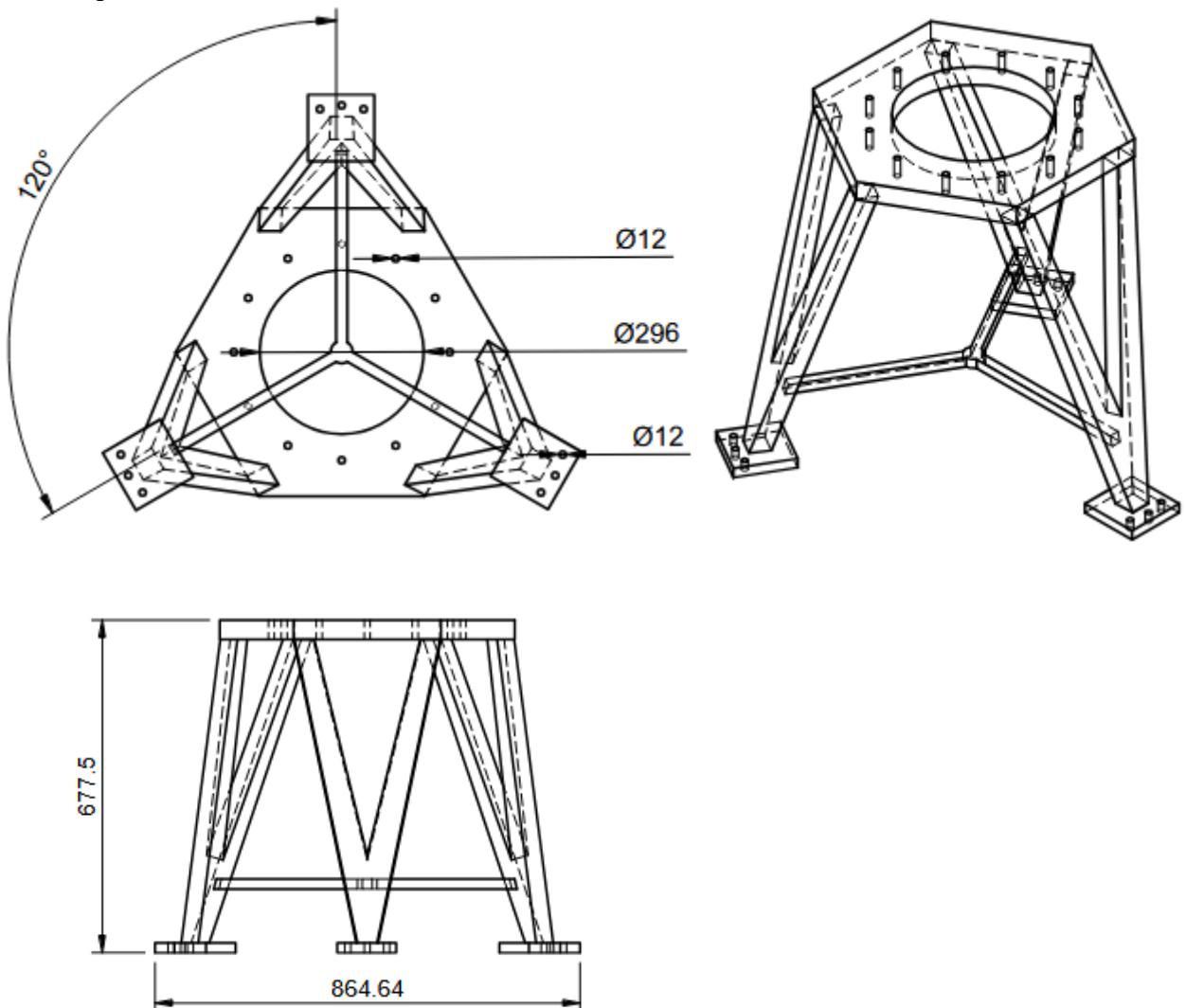
h. Back Rod



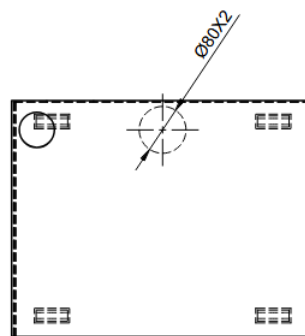
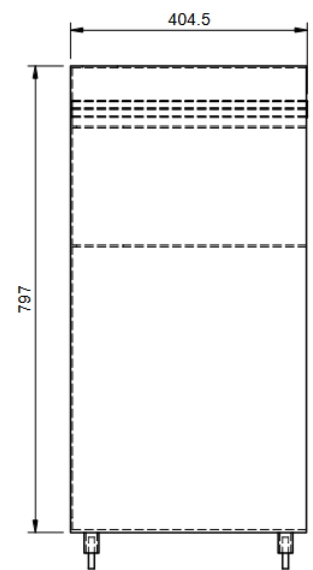
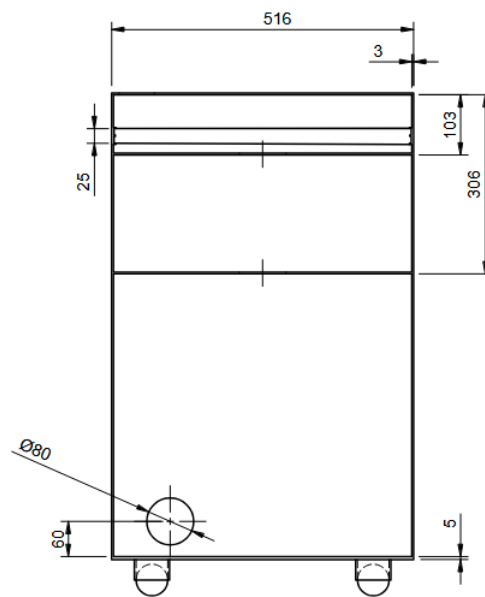
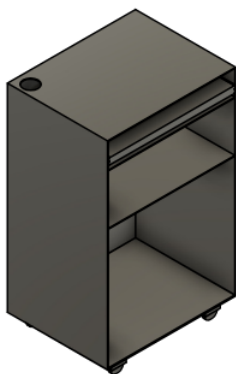
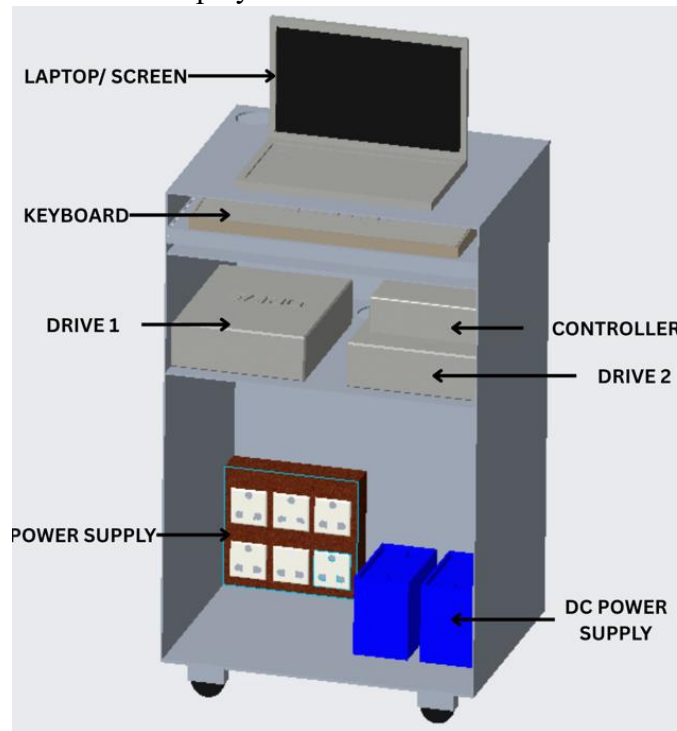
3. Base Mount



4. Tripod Table



5. Worktable for the control & display unit



Annexure – IV

Guidelines, Specifications, and Scope of Work for Product

A. Technical Terms for the Suppliers

Sr. No.	Description
1	The basic design shall be provided by COEP Technological University. The final design, including all modifications or optimizations suggested during development, shall be submitted for review and approval through the Design Approval Process (DAP) prior to prototype fabrication.
2	Supplier to submit the Design Approval Plan (DAP) within 4 weeks from receipt of the Supply Order.
3	Supplier to get approval for the Bought-out elements (Mechanical, Electrical, Electronics) during DAP meeting from the customer.
4	Supplier to demonstrate the actual working of Traverse & Elevation Axes, Mounting of weapon system, working of Trigger operating mechanism at supplier premises during the Pre Dispatch Inspection completely (Transportation,etc.) arranged by the supplier.
5	The system tracking performance shall maintain an accuracy of up to $\pm 0.05^\circ$, with traverse and elevation speeds of approximately $50^\circ/\text{sec}$.
6	The overall weight of the system shall not exceed 200 kg. With gun mount (L X B X H): the overall dimensions shall be up to 1200 mm (at 0° elevation) $\times$ 500 mm $\times$ 1500 mm (at 90° elevation). Without gun (L X B X H): the overall dimensions shall be up to 500 mm $\times$ 500 mm $\times$ 850 mm.
7	The PMSM Drives & External Encoders to have configuration such that these can be interfaced to End User Control system by the End User at later date.
8	The supplier shall establish and demonstrate a seamless hardware interface with MATLAB to ensure effective data communication and control. The supplier shall present the system's performance and results using MATLAB graphical outputs, clearly depicting the operational behavior and response characteristics of the prototype.
9	The system shall be certified to fire a 7.62 mm LMG in both single-shot and automatic modes and demonstrated under authorized live-fire testing.

B. Commercial Terms for the Suppliers

Sr. No.	Description
1	The Supplier shall demonstrate at COEP Technological University a fully functional weapon-mount system with powered traverse and elevation axes, secure mounting, and trigger actuation, capable of dynamic target tracking and drone-based lock-on.
2	Supplier to provide mutually consented/ predefined number of days for necessary training during commissioning trials.
3	Possession of a valid GST registration number is mandatory for supplier approval.
4	A warranty of three (3) years against manufacturing defects shall be provided by the supplier.
5	15% of the total amount shall be released as an initial advance upon issuance of the purchase order
6	35% shall be released upon submission of proof of procurement of components/materials against the purchase order subjected to a minimum of 60% items purchased as per the design submitted/ approved in DAP.
7	The remaining balance shall be paid upon satisfactory delivery, inspection, and acceptance of the final prototype.
8	The submission timeline shall be 5 months from the date of design approval after completion of the DAP process.

9	A penalty of 0.5% per day of the total purchase order shall be imposed on the Supplier for any delay in demonstrating and successfully proving the system as per the agreed-upon schedule.
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C. Scope of Work, Responsibilities and Deliverables of the Supplier

Sr. No.	Element / Scope of work	Qty	Remark
1	Design, manufacturing, Assembly of Tracking system	1	Designing of the Tracking system consisting of various subsystems to suit the requirement. Detail designing of the parts & generating manufacturing drawings for the Tracking system. Manufacturing of parts, purchase of Bought out elements. Assembly of the Tracking System – Mechanical elements + PMSM motors + Gear Boxes. Designing, manufacturing and assembly of Weapon cradle to accommodate 7.62 caliber weapon. The Mechanical integration of weapon cradle & Tracking system. Actual running of the system (Traverse axis + Elevation axis) with Control System provided for actual Running trials. This is to check and confirm satisfactory working of Traverse Axis & Elevation & Trigger operating mechanism.
2	PMSM with Brakes + Drive + Encoder + limit Switch for Traverse (Azimuth) mechanism.	1 Set	The communication protocol for the Drive unit will be finalised during the technical discussion & DAP stage. The Input/ Output of the controller, drives and motors will be finalised during technical discussions.
3	PMSM with Brakes + Drive + Encoder + limit Switch for Elevation (Altitude) mechanism.	1 Set	The communication protocol for the Drive unit will be finalised during the technical discussion & DAP stage. The Input/ Output of the controller, drives and motors will be finalised during technical discussions.
4	Control System for Idle working demonstration	1	A control system comprising of following elements to be provided for demonstrating the actual working of Traverse & Elevation axes of the system. • HMI (7" Touch screen) • PMSM motor + Drive – 02 Sets • PMSM Drive to be with Ethernet communication protocol. • Electrical control cabinet with necessary wiring. This control system is to be utilised for demonstrating the Traverse and Elevation movements of the unit during the Pre Delivery Inspection (PDI) trials at the Supplier's premises and during commissioning trials at the Purchaser's premises. Supplier to prove the following on his control system during PDI & commissioning trials. • Actual running of Traverse + Elevation axes • Mounting & fitment of Weapon system • Working of Trigger Operating mechanism. • System should be operational while testing for various control algorithm The PMSM drive system should be enabled to be interfaced with End User control System (Various control system algorithms will be arranged by the Purchaser at later date) during further Testing and Trials as per End User requirement.
5	Installation support in Pune for necessary period	1 Job	On-site support for necessary period till satisfaction of End-user for installation of the tracking system.

Approved:

Dr. S. S. Ohol, PI,
ARMREB Project,
Department of Mechanical Engineering
COEP Technological University
Pune- 411005

Dr. V. S. Rajguru, Co- PI,
ARMREB Project,
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Dr. G. V. Lakhekar, Co-PI,
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Pune- 411005

Dr. N. K. Chougule
HOD, Department of Mechanical Engineering
COEP Technological University
Pune- 411005

Appendix-B

Part 2: Commercial Bid

“Making of the prototype for operational Turret Mechanism” as per mentioned in the Annexure – I: Manufacturing of the prototype of turret mechanism, Annexure – II: Components of the prototype of turret mechanism, Annexure – III: Drawings of the prototype of turret mechanism, Annexure – IV: Instructions to the vendors about the scope of the total work

FORMAT & REQUIREMENTS

Tender Ref. No.:

Name of the Tenderer/Bidder:

Following format must be used:

Sr.No	Items Description	Qty.	Price in INR
1	Manufacturing of the Turret Gun Mechanism (TMG) system		
1.01	Traverse Mechanism with Base Mount Motion Range = 0 degree To 360 degree. As per the specifications and CAD model provided in the tender document (refer to Pages 6,7 and 8, Annexure-I, Annexure-III, and the CAD model on Pages 9 to 15, and in accordance with the Scope of Work for the bidder detailed in the Table on Pages 16 and 17.)	1	
1.02	Elevation mechanism. Motion Range = -20 degree To + 80 degree. Weapon Mounting cradle with a Solenoid for firing. As per the specifications & CAD model provided in the tender document (refer to Pages 6,7 & 8, Annexure-I, Annexure-III, & the CAD model on Pages 9 to 15, & in accordance with the Scope of Work for the bidder detailed in the Table on Pg. 16 & 17.)	1	
1.03	Tripod Table. As per the specifications and CAD model provided in the tender document (refer to Pages 6,7 and 8, Annexure-I, Annexure-III, and the CAD model on Pages 9 to 15, and in accordance with the Scope of Work for the bidder detailed in the Table on Pages 16 and 17.)	1	
1.04	Worktable for the control & display unit. As per the specifications and CAD model provided in the tender document (refer to Pages 6,7 and 8, Annexure-I, Annexure-III, and the CAD model on Pages 9 to 15, and in accordance with the Scope of Work for the bidder detailed in the Table on Pages 16 & 17.).	1	
1.05	Design, manufacturing, Assembly of Tracking system.(As per the specifications and CAD model provided in the tender document, pages 9 to 15)	1	
1.06	The bidder to demonstrate the actual working of Traverse & Elevation Axes, Mounting of weapon system, working of Trigger operating mechanism at bidder premises during the Pre Dispatch Inspection. (As per the specifications in Annexure IV, pages 16,17 and CAD model provided in the tender document, pages 9 to 15)	1	
1.07	The bidder shall provide a control system for idle working demonstration. The system shall remain fully operational during testing with various control algorithms.	1	
1.08	The bidder to provide mutually consented/ predefined number of days (minimum two numbers of one day training program) training for necessary training during commissioning trials(As per the specifications in Annexure IV, pages 16,17 and CAD model provided in the tender document, pages 9 to 15)	1	

1.09	Installation support at COEP Tech Pune / ARDE Pashan for the necessary period.	1	
2	Components of the TMG system		
2.01	Gear Box. As per the specifications and CAD model provided in the tender document (refer to Pages 7 and 8 Annexure-II, Annexure-III, and the CAD model on Pages 9 to 15), and in accordance with the Scope of Work for the bidder detailed in the Annexure-IV, on Pages 16 and 17.	2	
2.02	Motor with Brake (Azimuth Motor). As per the specifications and CAD model provided in the tender document(refer to Pages 7 and 8 Annexure-II, Annexure-III, and the CAD model on Pages 9 to 15), and in accordance with the Scope of Work for the bidder detailed in the Annexure-IV, on Pages 16 and 17.	1	
2.03	Motor with Brake (Elevation Motor) As per the specifications and CAD model provided in the tender document (refer to Pages 7 and 8 Annexure-II, Annexure-III, & the CAD model on Pages 9 to 15), and in accordance with the Scope of Work for the bidder detailed in the Annexure-IV, on Pages 16 and 17.	1	
2.04	Drive (Azimuth Motor Drive). As per the specifications and CAD model provided in the tender document(refer to Pages 7 and 8 Annexure-II, Annexure-III, and the CAD model on Pages 9 to 15), and in accordance with the Scope of Work for the bidder detailed in the Annexure-IV, on Pages 16 and 17.	1	
2.05	Drive (Elevation Motor Drive). As per the specifications and CAD model provided in the tender document (refer to Pages 7 and 8 Annexure-II, Annexure-III, & the CAD model on Pages 9 to 15), and in accordance with the Scope of Work for the bidder detailed in the Annexure-IV, on Pages 16 and 17.	1	
2.06	Programmable Power Supply, 60 Volts/30 amps. As per the specifications provided in the tender document (refer to Pages 7 & 8 Annexure-II, Annexure-III, and the CAD model on Pages 9 to 15), & in accordance with the Scope of Work for the bidder detailed in the Annexure-IV, on Pages 16 and 17.	1	
2.07	Microprocessor- Developer kit. As per the specifications provided in the tender document (refer to Pages 7 and 8 Annexure-II, Annexure-III, and the CAD model on Pages 9 to 15), and in accordance with the Scope of Work for the bidder detailed in the Annexure-IV, on Pages 16 and 17.	1	
2.08	Limit Switch. As per the specifications and CAD model provided in the tender document (refer to Pages 7 and 8 Annexure-II, Annexure-III, and the CAD model on Pages 9 to 15), and in accordance with the Scope of Work for the bidder detailed in the Annexure-IV, on Pages 16 and 17.	4	
2.09	External Encoder for motor position. As per the specifications and CAD model provided in the tender document (refer to Pages 7 and 8 Annexure-II, Annexure-III, and the CAD model on Pages 9 to 15), & in accordance with the Scope of Work for the bidder detailed in the Annexure-IV, on Pages 16 & 17.	2	
2.1	Microcontroller. As per the specifications provided in the tender document (refer to Pages 7 and 8 Annexure-II, Annexure-III, and the CAD model on Pages 9 to 15), and in accordance with the Scope of Work for the bidder detailed in the Annexure-IV, on Pages 16 and 17.	1	
2.11	Deep Groove Ball Bearing. As per the specifications and CAD model provided in the tender document (refer to Pages 7 and 8 Annexure-II, Annexure-III, and the CAD model on Pages 9 to 15), and in accordance with the Scope of Work for the bidder detailed in the Annexure-IV, on Pages 16 and 17.	4	

2.12	Slew Ring bearing. As per the specifications and CAD model provided in the tender document (refer to Pages 7 and 8 Annexure-II, Annexure-III, and the CAD model on Pages 9 to 15), and in accordance with the Scope of Work for the bidder detailed in the Annexure-IV, on Pages 16 and 17.	1	
2.13	Control Display Unit. As per the specifications provided in the tender document (refer to Pages 7 and 8 Annexure-II, Annexure-III, and the CAD model on Pages 9 to 15), and in accordance with the Scope of Work for the bidder detailed in the Annexure-IV, on Pages 16 and 17.	1	
2.14	Drone. As per the specifications provided in the tender document (refer to Pages 7 and 8 Annexure-II, Annexure-III, and the CAD model on Pages 9 to 15), and in accordance with the Scope of Work for the bidder detailed in the Annexure-IV, on Pages 16 and 17.	1	
2.15	Lidar. As per the specifications provided in the tender document (refer to Pages 7 and 8 Annexure-II, Annexure-III, and the CAD model on Pages 9 to 15), and in accordance with the Scope of Work for the bidder detailed in the Annexure-IV, on Pages 16 and 17.	1	
2.16	Inclinometer. As per the specifications provided in the tender document (refer to Pages 7 and 8 Annexure-II, Annexure-III, and the CAD model on Pages 9 to 15), and in accordance with the Scope of Work for the bidder detailed in the Annexure-IV, on Pages 16 and 17.	1	
2.17	Dummy guns. As per the specifications and CAD model provided in the tender document (refer to Pages 7 and 8 Annexure-II, Annexure-III, and the CAD model on Pages 9 to 15), and in accordance with the Scope of Work for the bidder detailed in the Annexure-IV, on Pages 16 and 17.	1	
2.18	Linear Solenoid actuator. As per the specifications and CAD model provided in the tender document (refer to Pages 7 and 8 Annexure-II, Annexure-III, and the CAD model on Pages 9 to 15), and in accordance with the Scope of Work for the bidder detailed in the Annexure-IV, on Pages 16 and 17.	1	
2.19	Electrical and Electronics Accessories (refer to Pages 7 and 8 Annexure-II, Annexure-III, and the CAD model on Pages 9 to 15), & in accordance with the Scope of Work for the bidder detailed in the Annexure-IV, on Pages 16 & 17.	10	
Total amount in Rs.			
GST@ 18%			
Total amount (Inclusive of all Taxes) in Rs.			
Total amount (inclusive of all taxes) in words Rupees			

Note: Payment within 30 days of delivery of the Turret Mechanism and satisfactory report from user.
Training & demonstration of item at the college for 5 days will be provided by firm/ company

Signature of the Vendor/Bidder
with stamp

To
The Vice-chancellor
COEP Technological University
Shivaji Nagar, Pune - 411005

Subject: Tender for Making of the prototype for operational Turret Mechanism at COEP Technological University, Pune through the e-Procurement System of the Government of Maharashtra (<https://mahatenders.gov.in/>).

Dear Sir,

I have carefully gone through the tender document regarding the prequalification of firm/company/agency/ bidder/vendor for Making of the prototype for operational Turret Mechanism at COEP Technological University, Pune through the eProcurement System of the Government of Maharashtra.

I shall be bidding in this tender as the sole representative of my company. I hereby declare that

1. All the information related to my company, customer base, projects, financial details, etc., provided in my offer is true and without any alteration /modification.
2. All the provisions of this tender document are acceptable to my company. No violation of the terms and conditions as mentioned in the tender document has been made.
3. I declare that my company or any member of the company has not been debarred/blacklisted by any Government / Semi-Government organizations in India.
4. I certify that the period of validity of the bid is 30 (Thirty) days from the last date of submission of the proposal. I further certify that I am the authorized signatory of my company and I am, therefore, competent to make this declaration.

Yours faithfully,

(Signature of the bidder/ vendor with seal)

Firm submitting tender.....

Telephone:Mobile:

Fax:E-mail:

Designation:

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List of Documents attached by the Bidder