

Design, Fabrication, Supply, Installation, Commissioning, Performance Demonstration and Training of Heavy Duty Rail Guided Precision Job Positioning System for Gantry Type Co-Ordinate Measuring Machine (CMM) at VSSC, Thiruvananthapuram

TECHNICAL SPECIFICATION

Introduction

Heavy Duty Rail Guided Precision Job Positioning System is intended to transfer various composite products and heavy toolings from job handling area to CMM measurement volume (to and fro). The system consists of a rigid, precisely levelled linear track system designed to handle significant weight and a motorized cart that travels over the rails with suitable mechanism to resume the travel through the discontinued path to accommodate existing sliding door and vibration isolation. Also a mechanism that ensures accurate position and alignment of the work piece within the CMM's measuring envelope (Refer figure:1&2).

Sl. No.	Specification	Suggested configuration
1.	<p>Top surface plate</p> <p>a. Size of surface plate</p> <p>i) Length: 2800 ± 10 mm</p> <p>ii) Width: 2400 ± 10 mm</p> <p>iii) Thickness: 25 ± 2 mm</p> <p>b. Height of the top surface from floor in locked condition: 1000 ± 10 mm</p> <p>c. Load carrying capacity: 4000 kg (excluding self-weight)</p> <p>d. Accuracy of the top and side faces of top plate in CMM working volume in locked condition.</p> <p>i) Top and side faces of top surface plate to be machined at a surface finish of $\nabla\nabla$ (1.6 to 8 microns) or better</p> <p>ii) Top surface shall be levelled within 0.2 mm to the XY plane of the CMM</p> <p>iii) Side surface shall be aligned within 0.2 mm to the corresponding CMM axis</p> <p>iv) Overall flatness error of top surface shall be within 0.2 mm (200 microns)</p> <p>v) Positional repeatability within 0.3 mm</p> <p>e. Work holding provisions</p> <p>i) Series of tapped holes (M10 with 500 mm grid size)</p> <p>f. Max permissible deflection at fully loaded condition (Locked condition) : ≤ 0.2 mm</p> <p>g. Hardness of the surface plate: 22 – 25 HRC</p>	<p>• Material of surface plate: Non-alloy low carbon structural steel</p> <p>• Surface plate mounted over fabricated steel back-up structure.</p> <p>Locked and supported using adequate number of hydraulic jacks.</p>
2.	<p>Movement</p> <p>a. Length of travel: 11m (approx.)</p> <p>b. Speed of travel: 8 to 10 m/min</p>	<p>Movement guided by rail and supported over 4 No's of wheels on 2 axles (Rail wheel type), Material EN - 8 or equivalent</p>

	<p>c. Straightness of the movement over entire length of travel within 2mm</p> <p>d. Rails will be fixed to the floor using chemically treated fasteners</p>	<p>Rails are fixed above the floor and maximum height permissible is 100mm (No major civil works are allowed)</p>
	<p>e. Movement mechanism.</p> <p>i) Acceleration and de-acceleration should be uniform</p>	
	<p>ii) System movement should be smooth and continuous without any jerk and noise</p>	<p>Wheel axle shall be driven by electric motor controlled VFD (Variable frequency drive). Motor and control should be from any leading brands available in India (viz. Siemens, Mitsubishi, L&T, Honeywell, Schneider etc.)</p>
	<p>iii) At any moment of time, the system top plate should be maintained in the levelled position irrespective of movement, on rest, power on, power off condition</p>	<p>Well proven mechanism or system to be incorporated</p>
	<p>f. Mechanism for continuity of travel</p> <p>i) Provision for discontinuity due to existing vibration isolator: Party shall evolve a suitable mechanism to resume the travel through the discontinued path considering existing vibration isolator</p> <p>ii) Provision for discontinuity in travel due to sliding door for 10cm thickness (approx.): Party shall evolve a suitable mechanism to resume the travel through the discontinued path considering sliding door (Refer figure:2).</p>	
3.	<p>Power supply</p> <p>a. Power rating: 3 phase supply 440 V / 50 Hz</p>	

4.	<p>Control and Safety</p> <p>a. Control panel</p> <p>i) Forward & reverse movements shall be controlled by switches and sensors available on control panel which shall be either fixed or hand held</p> <p>ii) System movement should be enabled only while movement switch is active</p> <p>b. Brake</p> <p>i) When the operator disengages the switch, movement should be stopped & brake should be applied simultaneously</p> <p>c. Mechanical & Electrical stoppers</p> <p>i) On the extreme ends of the travel</p> <p>d. Emergency stop switch</p> <p>i) At front side on the control panel</p> <p>ii) At the rear side of surface plate</p> <p>e. Audio & Visual indicators</p> <p>i) LED display unit with touch screen</p> <p>ii) Start & Stop functions</p> <p>iii) Alarm & conscious messages</p> <p>iv) Preventive maintenance alert indication</p> <p>v) Indication during movement of system</p> <p>vi) Alert messages on emergency situations</p> <p>vii) Indicator for status of operations/conditions</p> <p>viii) All safety interlock shall be provided</p>	
	<p>f. Routing of power and control cables:</p> <p>i) It should be safe, convenient and aesthetically good</p>	Automatic Cable-Winding/Unwinding system
	<p>g. Safely devices and insulation class:</p> <p>i) As per relevant IS standards.</p>	
5.	<p>Compliance chart</p> <p>Party has to duly fill in the compliance chart provided in true sense. i.e. required parameters/information should be a part of quote. “Yes/No” statements OR simple statement of “complied” against the technical specification is not acceptable for evaluating the offers.</p>	
6.	<p>Pre-qualification</p> <p>Essential documents for the evaluation of technical offer.</p> <p>a. Supplier should be following Make In India policy as per government norms.</p> <p>b. Company profile with registration details including address, telephone no., email id, background, experience, annual turnover etc.</p> <p>c. Conceptual design and detailed implementation milestone/stages</p> <p>d. Documents such as figures/drawings/3D CAD models in support of the vendor proposed configuration, construction, control system, safety provisions etc. those are specified in the technical specification to be provided</p> <p>e. Relevant catalogues, Photographs, Brochures of the proposed system/sub-systems etc.</p>	

	f. National/international standards followed for the design, manufacturing, installation and testing of the systems	
7.	<p>Offer requirements</p> <p>Offers to be provided with all comprehensive details which are verifiable to meet our specification.</p> <p><u>Quotation shall be in two parts</u></p> <p>i) Part 1: Technical cum commercial (Price figures should not be revealed)</p> <ul style="list-style-type: none"> • Compliance chart, relevant documents etc. as mentioned in the technical specification • The Offer will be disqualified if price is disclosed in techno-commercial bid. <p>ii) Part 2: Price bid</p> <ul style="list-style-type: none"> • Price details should be entered only at the relevant fields in the e-portal website. It shall not be disclosed at any other place. 	
8.	<p>Part 1 offer details</p> <p>Party shall provide the following details:</p> <ol style="list-style-type: none"> i) Proposed configuration of main elements listed in the specification's viz. top surface plate, movement mechanism, safety features, power supply, accessories, etc. with figures/drawings, relevant catalogues of system/sub-systems, photographs, brochures etc. are essential for evaluation. ii) The standard followed for the design, manufacturing, installation, testing of the system to be furnished. iii) Availability of consumables, basic spares required for operation should be ensured by manufacturer for a period of 12 years (min.) after warranty period iv) Party has to duly fill in the compliance chart provided in true sense. ie. required parameters/information should be a part of quote. "Yes/No" statements OR simple statement of "complied" against the technical specification is not acceptable for evaluating the offers. v) Supplier shall specify whether OEM / dealer (if dealer, authorisation letter from OEM to be submitted) vi) Non-comprehensive AMC cost per visit for a period of 5 years (min) to be quoted. vii) List of spares with tentative price for Non-comprehensive AMC for a period of 5 years (min) <p>Offers not meeting the above mentioned clauses will be summarily rejected.</p>	
9.	<p>Part 2 offer details (Price bid)</p> <p>Part 2 of the offer should contain cost for the Basic system which includes installation, commissioning and training charges (details included in Sl. No. 1 to 4)</p> <p>Note:</p> <p>Price details should be entered only at the relevant fields in the e-portal website. It shall not be disclosed at any other place.</p>	

10.	<p>Evaluation of offers</p> <ol style="list-style-type: none"> a. The conceptual design & related documents such as figures/drawings/3D CAD models in support of the vendor proposed configuration, construction, control system, safety provisions etc. submitted by the party in the technical offer will be evaluated by VSSC b. Vendors who are qualified in the evaluation only will be considered for further tender processing 	
11.	<p>Pre-bid meeting</p> <ol style="list-style-type: none"> a. Pre-bid meeting will be conducted within 10 days of tender date. b. The Vendor shall mandatorily participate in person in a Pre-Bid Meeting which will be organized at VSSC, Vattiyorkavu, Trivandrum. c. The bid from the vendors, who have participated in the pre-bid meeting only will be considered for further evaluation. d. The Vendor shall inform their interest to participate in pre-bid meeting within 7 days from date of issue of this tender to pso_cmse_pur@vssc.gov.in with the following details: <ul style="list-style-type: none"> • Name and address of the Vendor in full. • Name of the person(s): not more than 3 persons from a Vendor • Designation of the participating persons • ID proof details including ID. No's • Authorizing letter from the vendor for the above persons for attending this pre-bid meeting mentioning tender reference 	
12.	<p>Pre-delivery inspection:</p> <ol style="list-style-type: none"> a. Pre-delivery inspection shall be carried out at party's site for the evaluation of the system as per specification in the purchase order. b. In house inspection of all the required aspects shall be completed by the party and sent to VSSC for the assessment of the system for pre-delivery inspection. c. For pre-delivery inspection by VSSC, two weeks lead time may be provided for travel planning, etc. 	
13.	<p>Performance demonstration & acceptance</p> <ol style="list-style-type: none"> a. The system will be accepted only after the successful installation and commissioning b. The system to be demonstrated successfully for the specified configuration 	
14.	<p>Training on operation and maintenance</p> <p>Minimum 5 days of training pertaining to operation and maintenance & trouble shooting (Mechanical, Electrical, Electronics, Hydraulic systems etc.) to be provided to the VSSC personnel at CMSE, Vattiyorkavu, Thiruvananthapuram</p>	

15.	<p>Documentation</p> <p>Operator and maintenance manual (hard & soft copies) for mechanical, electrical, electronics, hydraulic systems etc. to be provided.</p>	
16.	<p>Warranty</p> <p>i) Minimum 2 years warranty from the date of acceptance at VSSC</p> <p>ii) Any issue observed during the warranty period shall be resolved at free of cost</p>	
17.	<p>Payment:</p> <p>100% payment will be released after successful Supply, Installation, Commissioning, Performance Demonstration and Training of Heavy Duty Rail Guided Precision Job Positioning System at VSSC, Thiruvananthapuram</p>	
18.	<p>Annual Maintenance Contract</p> <p>a. Party shall include under his quote for non-comprehensive AMC for a period of 5 (Five) years mentioning per year charges after warranty period.</p> <p>b. The scope shall be 3 (Three) preventive visits per year and to attend any number of break down calls.</p> <p>c. List of probable spares (mentioning their warranty period and tentative price) to be replaced during the AMC period to be included by the party.</p>	

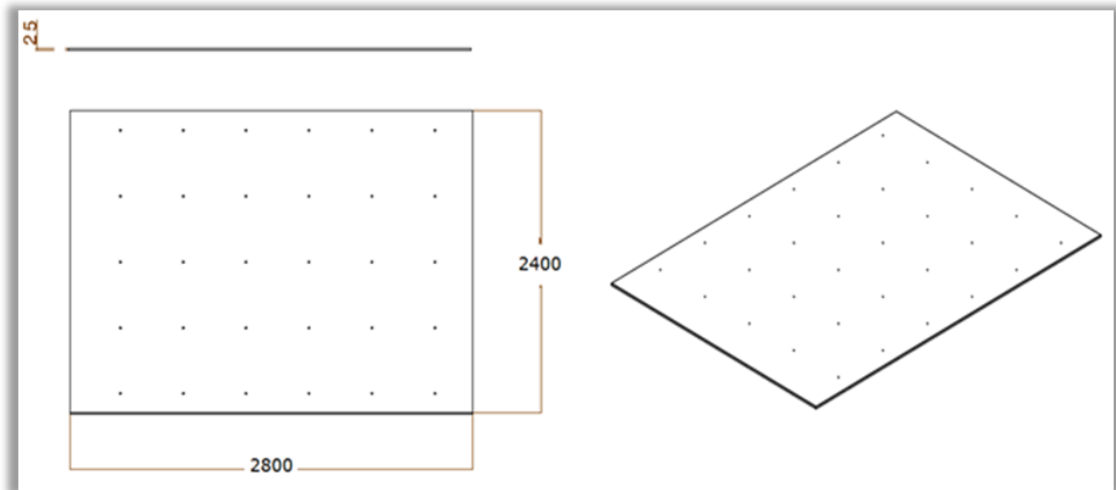


Figure - 1

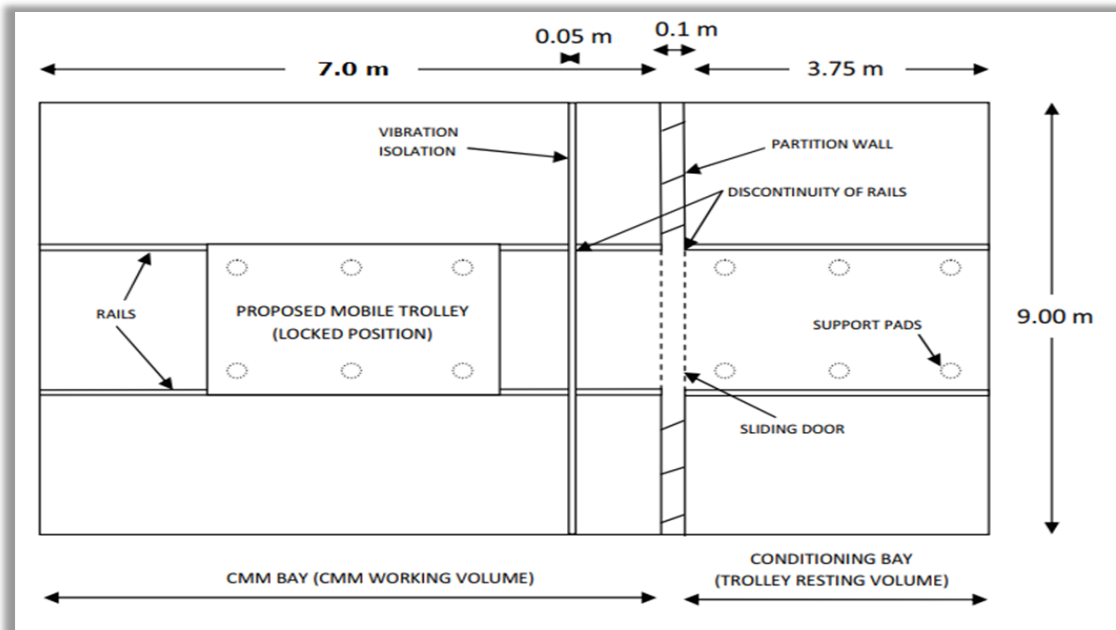


Figure - 2