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An Aided Institute of Department of Atomic Energy,
Government of India



इन्दिरा पुल के पास, भट, गांधीनगर - 382 428 भारत
दूरभाष: (079) 2396 2020/2021/2028
फैक्स: 91-079-23962277
वेब: www.ipr.res.in

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DIST. GANDHINAGAR - 382 428 (INDIA)
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ENQUIRY

ENQUIRY NO : IPR/EQL/18-19/350
Date : 09-01-2019

Due on : 07-02-2019 by 1:00 PM IST

Please send your offer in sealed envelope specifying Enquiry No, Date & Due Date, ALONG WITH your credentials for the following items:

Important Note:

Please note that e-mail quotations are not acceptable however you may send your queries (if any) to localpurchase@ipr.res.in

Please ensure your sealed quotation reaches this office not later than above mentioned due date and time.

Kindly go through the following documents properly before quoting which are available on the IPR web portal i.e., http://www.ipr.res.in/documents/tender_terms.html / attached herewith.

- 1) Instructions to the bidders & Terms and conditions (refer Form No: **IPR-LP-01.V4**)
- 2) Bidding format

GST for Goods and Services (IGST/CGST/SGST TAX BENEFITS): Please refer **clause no: 8** of Form No: **IPR-LP-01.V4**

QUOTATION SHOULD BE ADDRESSED TO PURCHASE OFFICER ONLY

Sr No	Description	Quantity
1	Supply of Complete Actuation System as per attached specification for SCARA Arm	1.0 Nos.

Note: TDS as per CGST Act: As per provisions of section No. 51 of the CGST Act 2017, TDS @2% (IGST 2% or CGST 1% and SGST 1%) will be deducted while making payment to the suppliers where total value of orders/contracts/work orders exceeds Rs. 2.5 lakhs, in the event of order in Indian Rupees. Necessary TDS Certificate will be issued to the supplier after TDS deduction.

Encl: As per attachment.

Sd/-

Mr. D. Ramesh
Purchase Officer-II

Information to Vendors: We are working towards a single platform for our future requirement. Hence, please refer IPR website i.e, <http://www.ipr.res.in/documents/tenderseng.html> for our future requirement.

Title	<u>Supply of Complete Actuation System for Robot as per the given Functional Specifications</u>
Description	<ol style="list-style-type: none"> 1. This tender document provides the basis for supply of 2 Quantities of complete actuation system for robot application. 2. <u>The actuation system for this tender is defined as components including: Actuator System = Motor + Gearbox + Encoder/Feedback + Holding brake + Controller/Drive + Power Cables + Encoder Cables + Power Supply Connectors + Encoder/Feedback Connector</u> 3. The required functional specification for the actuator system is provided in this document. The vendor shall choose corresponding actuator system components to achieve the mentioned functional specifications. 4. The vendor has to fill the Annexure 1 based on the chosen actuator system components. All related OEM specification sheets, drawings should be submitted by the vendor. 5. If the chosen actuator system by vendor has deviations in functional specifications than as mentioned in this tender, it should be clearly communicated to IPR. 6. The financial quotation should include a clear breakup of component price, GST, packaging and forwarding as per Annexure 2. 7. No component of the actuator system (e.g. Connector/cable etc.) should be quoted as 'optional'. If the component is required for the functioning of the actuator systems it should be directly quoted.
Scope of IPR	<ol style="list-style-type: none"> 1. IPR will supply the required functional specification that is to be achieved by the Actuator System. These specification is required at the output shaft of the gearbox. 2. IPR will evaluate the Annexure 1 supplied by the vendor to verify if the functional specification is achieved. 3. IPR will conducted Site Acceptance Test for the Actuator system.
Scope of Vendor	<ol style="list-style-type: none"> 1. The vendor shall evaluate the required motor + gearbox + encoder + holding brake, combination to achieve the functional specification given by IPR. 2. Vendor shall fill the Annexure 1 as per the specifications of the actuator system components. 3. Vendor should submit all OEM specification sheets and drawings along with the bid.



4. If the vendor requires any further information to decide the required components of actuation system, it should be communicated to IPR through proper channel.
5. Vendor shall communicate to IPR any deviations in the achieved functional specifications than as mentioned in this tender.
6. Vendor shall not quote any 'OPTIONAL' components. If any component such as cables, connectors etc. is required for the functioning of the actuation system it should be directly quoted.

Functional Specifications

1. The robotic system comprises of 2 Joints.
2. Below, the functional requirements for both the joints.
3. **NOTE:** Functional specifications are defined at load side i.e., at the output shaft of the gear box.

4. Functional Specifications for Joint 1:

Sr. No.	Parameter	Functional Specification for IPR
1	Required angle of rotation at Output Shaft of Gearbox	+/- 140 deg
2	Required Constant Acceleration at Output Shaft of Gearbox	~12.5 rad/sec ²
3	Acceleration time at Output Shaft of Gearbox	0.2s
4	Constant Velocity at Output Shaft of Gearbox	~2.5 rad/sec (~25 rpm)
5	Maximum Torque (acceleration and braking) at Output Shaft of Gearbox	42 Nm
6	Nominal Torque at Output Shaft of Gearbox	12 Nm
7	Moment Load about rotation axis at Output Shaft of Gearbox	0.4 Kg ^m ²
8	Axial Force (Fa) at Output Shaft of Gearbox	180N
9.	Output Shaft Type at Output Shaft of Gearbox	Flange Type or shaft type The entire shaft should fit within the given space envelope.
10.	Actuation Requirement	DC motor/Servo motor + Gearbox + Holding brake + Encoder
12.	Maximum Dimensional Constraints (Motor + Gearbox Assembly + Encoder + Holding brake)	L x W x H = 100 x 100 x 250 (mm) (deviation to be communicated with IPR)

14.	Communication Protocol for controller	CANOpen/EtherCAT Communication
15.	Maximum weight for Motor + Gearbox + Encoder + Holding brake	< 3.5kg

5. Functional Specification for Joint 2:

Note: A trapezoidal load profile at output shaft gear box is considered above.

Sr. No.	Parameter	Functional Specification for IPR
1	Required angle of rotation at Output Shaft of Gearbox	+/- 140 deg
2	Required Constant Acceleration at Output Shaft of Gearbox	~12.5 rad/sec ²
3	Acceleration time at Output Shaft of Gearbox	0.2s
4	Constant Velocity at Output Shaft of Gearbox	~2.5 rad/sec (~25 rpm)
5	Maximum Torque (acceleration and braking) at Output Shaft of Gearbox	12 Nm
6	Nominal Torque at Output Shaft of Gearbox	6 Nm
7	Moment Load about rotation axis at Output Shaft of Gearbox	0.2 Kgm ²
8	Axial Force (Fa) at Output Shaft of Gearbox	150N
9	Output Shaft Type	Flange Type or shaft type The entire shaft should fit within the given space envelope
10.	Actuation Requirement	DC motor/Servo motor + Gearbox + Holding brake + Encoder
11	Maximum Dimensional Constraints (Motor + Gearbox Assembly)	L x W x H = 100 x 100 x 250 (mm) (deviation to be communicated with IPR)
12	Communication Protocol for controller	CANOpen/EtherCAT Communication
13	Maximum weight for Motor + Gearbox + Encoder + Holding brake	< 2.5kg

Annexure 1.

Selected Motor Specifications By Vendor for Joint 1	
<i>Instruction: It is mandatory to fill the actual values in the columns below</i>	
Rated Speed – (RPM)	
Rated Torque (Nm)	
Rated Power (kW)	
Peak Torque (Nm)	
Peak Current (A)	
Continuous Stall Torque (Nm) (for 100oC Winding Temperature Rise)	
Shaft Inertia (Jm)	
Motor Weight (kg)	
Motor Size (L x B x H)	
Motor Make and Model	
Is brake included (Yes/No) Please fill the details of the brake	
Encoder type and make	
Encoder resolution	

Selected Motor Specifications By Vendor for Joint 2	
<i>Instruction: It is mandatory to fill the actual values in the columns below</i>	
Rated Speed – (RPM)	
Rated Torque (Nm)	
Rated Power (kW)	
Peak Torque (Nm)	
Peak Current (A)	
Continuous Stall Torque (Nm) (for 100oC Winding Temperature Rise)	
Shaft Inertia (Jm)	
Motor Weight (kg)	
Motor Size (L x B x H)	
Motor Make and Model	
Is brake included (Yes/No) Please fill the details of the brake	
Encoder type and make	
Encoder resolution	

MANDATORY DOCUMENT: Attach OEM specification sheet for the motors.

Selected Gear Box Specifications By Vendor for Joint 1	
<i>Instruction: It is mandatory to fill the actual values in the columns below</i>	
Reduction Ratio	
Standard backlash	
Efficiency at full load	
Gearbox weight	
Mass moment of inertia	
Nominal output torque	
Max. output torque	
Max. mechanical input speed	
Gear box Size (L x B x H)	
Gear box make and model	

Selected Gear Box Specifications By Vendor for Joint 2	
<i>Instruction: It is mandatory to fill the actual values in the columns below</i>	
Reduction Ratio	
Standard backlash	
Efficiency at full load	
Gearbox weight	
Mass moment of inertia	
Nominal output torque	
Max. output torque	
Max. mechanical input speed	
Gear box Size (L x B x H)	
Gear box make and model	

MANDATORY DOCUMENT: Attach OEM specification sheet for the Gearbox

Selected Controller	
<i>Instruction: It is mandatory to fill the actual values in the columns below</i>	
Controller type	
Controller platform	
Controller dimensions	
Are all connecting wires for controller and motor quoted?	

MANDATORY DOCUMENT: Attach OEM specification sheet for the Controller

Annexure -2

MANDATORY: Price-bid Format

	Unit Price	GST	Packaging and Forwarding charges	Net Price / Unit	Quantity	Total
Motor for Joint 1						
Motor for Joint 2						
Gear Box for Joint 1						
Gear Box for Joint 2						
Controllers						
Cables and Connectors						