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### प्लाज्मा अनसधान सस्थान INSTITUTE FOR PLASMA RESEARCH



# परमाणु ऊर्जा विभाग, भारत सरकार का एक सहायता प्राप्त

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

इन्दिरा पुल के पास, भाट, गांधीनगर - 382 428 भारत

द्रभाष: (079) 2396 2020/2021/2028 फैक्स: 91-079-23962277

वेब: www.ipr.res.in

NEAR INDIRA BRIDGE, BHAT

DIST. GANDHINAGAR - 382 428 (INDIA) Phone: (079) 2396 2020/2021/2028

Fax: 91-079-23962277 Web: www.ipr.res.in

#### **ENQUIRY**

**ENQUIRY NO** : IPR/EQL/18-19/350

Date : 09-01-2019

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

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	1.0 Nos.
	SCARA Arm	

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, <a href="http://www.ipr.res.in/documents/tenderseng.html">http://www.ipr.res.in/documents/tenderseng.html</a> for our future requirement.

1. This tender document provides the basis for supply of 2 Quantities of complete actuation system for robot application.  2. 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  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.  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.		Supply of Complete Actuation System for Robot as per the given Functional Specifications
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- 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 +/- 140 deg			
1	Required angle of rotation at Output Shaft of Gearbox				
2	Required Constant Acceleration at Output Shaft of Gearbox	~12.5 rad/sec <sup>2</sup>			
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 Kgm <sup>2</sup>			
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 = $100 \times 100 \times 250$ (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/sec²		
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 Kgm²		
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 = $100 \times 100 \times 250$ (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.

Instruction: It is mandatory to fill the actual value	ies in the columns below
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	
s brake included (Yes/No)	
Please fill the details of the brake	
Encoder type and make	
ncoder resolution	

Selected Motor Specifications By Vendor for	or Joint 2
Instruction: It is mandatory to fill the actual v	values in the columns helow
Rated Speed – (RPM)	The state of the s
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	The state of the Market and the second of th
Encoder resolution	

MANDATORY DOCUMENT: Attach OEM specification sheet for the motors.

Selected Gear Box Specifications By Vend	or for Joint 1
Instruction: It is mandatory to fill the actual	values in the columns below
Reduction Ratio	9000
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	
	1
Selected Gear Box Specifications By Vendo	or for Joint 2
Instruction: It is mandatory to fill the actual v	values in the columns helen

Selected Gear Box Specifications By	Vendor for Joint 2
Instruction: It is mandatory to fill the	actual values in the columns below
Reduction Ratio	The Columnia Octovy
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	
Instruction: It is mandatory to fill the actual va	lues in the columns helow
Controller type	The Columns Octors
Controller platform	
Controller dimensions  Are all connecting wires for controller and makes	Contract to the second
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	Net Price /	Quantity	Total
			and	Unit		
			Forwarding			
			charges			
Motor for						
Joint 1						
Motor for						
Joint 2						
Gear Box						
for Joint 1						
Gear Box					,	
for Joint 2						
Controllers						
Cables and						
Connectors						