

TECHNICAL SPECIFICATION FOR

6 DEGREE-OF-FREEDOM LIGHTWEIGHT COLLABORATIVE ROBOT (COBOT) WITH MANIPULATOR, CONTROLLER, TEACH PENDANT, AND NECESSARY ACCESSORIES.

The robot should meet all the following technical specifications and terms and conditions, unless otherwise stated.

1. MANIPULATOR AND CONTROLLER (COBOT)

Number of joint axes	Six rotating joints
Joint transmission	Harmonic Drive gears
Communication	Control frequency at least 500 Hz (Low level) Ports: USB, Ethernet.
Total Weight of the robot	Maximum 25Kg
Payload	Minimum 2 Kg
Maximum reach	Minimum 750 mm
Temperature during operation	Maximum 55 degree
Pose Repeatability	within ± 0.1 mm
Programming Language	C++ and/or Python
Software Compatibility	1. Default API/GUI 2. Should have a ROS compatibility
Operating system	Windows and/or Linux
Control and sensing	Position, Velocity, Force/Torque (for all the joints)
Force Range along X-Y-Z axis	Minimum 25 N
Torque Range about X-Y-Z axis	Minimum 7.5 Nm
Protection rating	Minimum IP33 standard

2. TEACH PENDANT

Programming Interface	Teach pendant with touch screen, emergency stop, etc.
Cable length	At least 2 meter
Weight	Maximum 2 Kg

3.1: FORCE TORQUE SENSOR

Force range F_x, F_y, F_z	Minimum 25 N
Moment range M_x, M_y, M_z :	Minimum 10 N
Weight	Maximum 400g
Hardware interface compatibility	Could be used independently, even in the absence of a manipulator. Compatible with the gripper
Programming Language	C++ and/or Python
Software Compatibility	1. Default API/GUI 2. Should have a ROS compatibility

Terms and condition:

1. All the axes should contain sensors to provide signals for robot control (e.g., position control and impedance control) as a protective function.
 2. The robot should be equipped with a force/torque sensor that is compatible with the Gripper to perform high-precision assembly tasks, and to precisely detect and measure the contacts.
 3. Power and communication cables, compatible software, and couplings for Gripper (3.1) and Force/torque sensor (3.3) should be provided.
 4. All software packages (ROS Packages, Matlab scripts (optional)) and sample software programs (ready to program tasks) should be supplied with the robot.
 5. The structure of the robot should be rigid and free from vibrations.
 6. The robot should be fitted with all electrical items to carryout work immediately.
 7. The operation and maintenance manuals of the robot have to be supplied.
 8. All necessary and suitable accessories such as base frame, clamps for tabletop fitting, etc., should be included.
 9. Direct access to each actuator is preferred.
 10. A portable casing is preferred for safe transportation.
 11. All the actuators should operate at comparatively less noise.
 12. Should provide at least 3 years warranty.
 13. Vendor eligibility criteria – previous supply details. Installation/ commissioning required.
AMC – Not necessary
 14. Vendor should provide details of their previous supply in other institutes/in India and abroad
 15. Vendor should have supplies such item to Institution/Organization/University/Research labs in India and abroad for at least past two years and should provide details of the same.
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