

54024 is a user-friendly table-top 5 axis articulated robot. The robot is constructed with die cast aluminium for durability and built with standard stepper motors in the joints. For gripper actuation, the robot uses an RC servo motor. The robot is light and easy to use. The robot consists of a dedicated motion controller. The controller is a plug-n-play controller with a USB cable for swift interfacing. The robot kit is a self-installation kit. The users can use the M-Robot software to follow the steps of installation, commissioning and operating the robot immediately. Simple online programs can be quickly written and saved. The Application Kit will consist of an aluminium profile plate, a pallet, balls (10 no's), a gravity feeder, building blocks, a paint kit.

Objective

Programming and control of the robot for general purpose application or special purpose application both thru manual as well as Auto mode control for repetitive tasks. Discern & understand the stepper motors, RC servo motor functionality & control methodology.

Learning Objectives:

Having successfully completed this lab, the student will demonstrate knowledge in –

- Study of Classification of robots
- Study of kinematics of robot
- Programming techniques
- Application of robot
- control aspects of various Driving system (Stepper & RC servo)
- Understanding of robot inter-joints, kinematics and control methodology.
- Demonstrate knowledge in the control system of robot
- Demonstrate knowledge in the operating industrial robots.
- Learn about the maintenance of these systems



SPECIFICATIONS	In metric units		In SAE units	
Number of Axes	5 (3 axes waist – shoulder – elbow Manipulator with 2 axes pitch– roll)			
Link 1	mm	120 mm	in	4.7
Link 2	mm	100 mm	in	4
Vertical Height	mm	250 mm	in	9.8
Reach	mm	100-295	in	4-11.9
Joint Actuators	Stepper motors		Stepper motors	
Transmission	Gear train		Gear train	
Joints	Ball bearing		Ball bearing	
Position Feedback	Open loop		Open loop	
Gripper	angular (50mm opening)		angular (2 inch opening)	
Gripper Actuator	Geared RC Servo Motor		Geared RC Servo Motor	
Gripper Transmission	Spur Gear mechanism		Spur Gear mechanism	
Payload	gms	250	lbs	0.55
Waist	degrees	300	degrees	300
Shoulder	degrees	90	degrees	90
Elbow	degrees	90	degrees	90
Pitch	degrees	170	degrees	170
Roll	degrees	200	degrees	200
Controller	PC based Stepper Control algorithm			
Control Software	Specially developed Robot Programming Language.			
Path Type	Point-to-Point			
Communication	PC USB Port			
Accessories & Input/output	8 digital Inputs/Outputs			
Power supply	110V/ 230V AC, 50/60 Hz, 5A			
Repeatability	mm	1	in	0.04
Resolution	mm	1	in	0.04
Weight of Robot	kg	8	lbs	17.6

Note: Specifications are subject to change.

Tesca Technologies Pvt. Ltd.

IT-2013, Ramchandrapura Industrial Area, Sitapura Extension,
Near Bombay Hospital, Vidhani Circle, Jaipur-302022, Rajasthan, India,
Tel: +91-141-2771791 / 2771792; Email: info@tesca.in, tesca.technologies@gmail.com
Website: www.tesca.in

Weight of control box	kg	3.4	lbs	7.5
Robot size	mm	325 x 300 x 160	in	13 x 12 x 6.4
Control box size	mm	340 x 270 x 120		13.6 x 10.8 x 4.8
Construction Members	Aluminium with powder coated			
SET OF STANDARD EXPERIMENTAL KIT FOR MINI ROBOT				
1. Ball Pallet - 2 nos.			Nos.	2
2. Dia 30 mm Ball - 10 nos.			Nos.	10
3. Building Block - 4 nos.			Nos.	4
4. Ball Feeder - 1 no.			No.	1
5. Paint with brush - 1 Set.			Set	1
SET OF STANDARD OPERATION AND MAINTENANCE SPARES FOR ONE YEAR				
Gripper Card			No.	1
Elbow Gear			No.	1
Roll Motor			No.	1

Training Skills-

- Introduction to Robot programming & Driving system (Stepper & RC servo)
- Theoretical & practical knowledge
- Understand of robot kinematics
- Programming techniques
- Robot programming using Lead through & Teach method.
- Programming logic in Joint/axial and world co-ordinates.
- Trouble shooting & safeguarding
- Learn about the Possibility of Faulty programming and corrective methods.
- Learn about the Systematic approach to troubleshooting of joints/actuators.

Experiments -

- Robot programming for a pick & place using world co-ordinates and teaches method.
- Programming for a stacking operation using axial co-ordinates and Lead Through method.
- Teach a robot for painting application using the joint programming in teach mode.
- Write a program to palletize an array of balls under material handling applications.
- Write down simple Programming with simultaneous movement
- Teach a robot with simple loop Program for loading/unloading.
- Program a robot with loop programming with various speeds
- Program using wait command & gripper
- Study on the merits and demerits using various programming techniques and logic. Justify it with suitable applications.
- Teach a robot for loading/unloading in mini application using the joint or axial programming in lead through method.
- N - no. of numerous experiments and operations possible within the work envelope.

REQUIRED EQUIPMENT AT SITE FOR CNC MACHINES (OR) UTILITIES TO BE PROVIDED BY THE BUYER DURING COMMISSIONING, DEMONSTRATION & TRAINING

Desktop computer on network

Operating System : Windows 7 Professional or higher, Two free USB ports

Processor: Intel 2,8 GHz or higher, RAM : at least 4 GB, 1 DVD Drive for software installation

Graphic Card : NVIDIA geforce at least 1 GB or equivalent, Recommended: 19" TFT Monitor

Note: As part of continuous improvement, Tesca reserves the right to alter machine design and specification without prior notice.

Ordering Details		
SN.	Order Code	Details
1.	54024A	Export Packing

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