

**STATION 1:** Distribution Station: The bottle is dispensed from the dispensing module and is transferred to testing station by rotary pick and place.

**STATION 2:** Testing Station: The bottle is checked for height and material (metal or non-metal). Rejected bottles are pushed into the rejection chute. The bottles that pass are transferred to the Processing Station.

**STATION 3:** Processing Station: The rotary indexing table will index the bottle to filling module and then capping module. Capped bottles are moved to the unloading position.

**STATION 4:** Buffer Station: The capped bottle is placed on the buffering conveyor and each bottle is transferred from the loading position to the unloading position.

**STATION 5:** Sorting Station: A sensor detects the capped bottle when placed on the conveyor. The conveyor moves forward and places the bottle in front of color sensors. The bottles are sorted into Slide Rack1 or 2 depending on the color.

**STATION 6:** ROBOT STATION: This station can be optionally integrated with the 540336S system. The 6 axis Aristo robot picks the empty workpieces and places in the stacking queue for distribution. The robot will continuously fill the stacking with bottle until the high limit is reached.



### Learning Objectives:

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

#### In Automation Technology

- Basic and advanced concepts in automation.
- Basic and Advanced applications of automation in industries
- Basic and Advanced applications of Sensors, Pneumatics in automation.
- Demonstrate working knowledge of systems & Production Planning
- Learn Automation technology.
- Study the actual control system used in industries
- Detailed training in troubleshooting, fault detection & correction
- Maintenance & servicing of these systems

### TECHNICAL SPECIFICATIONS

- **Key Advantages of Tesca Mechatronics MAPS systems:**
- The industry is looking for students who have skills and knowledge of **integrated engineering technologies and problems solving skillsets**. Tesca's Adv Mfg & Automation training solutions are designed to deliver the same through our **Industry 4.0 Smart Factory, and Smart Mechatronics products**. We have already delivered over **50+ systems globally** to highly reputed educational institutions.
- The Tesca product portfolio is ready for Industry 4.0 integration and IIOT Training
- Our training solutions are developed with focus on delivering skills and transferrable knowledge that students can carry from their classroom/ labs to the industry
- Our hardware is accompanied with world-class online training courses (SKILLON365)
- **IOT Ready:** Equipment is Internet of Things ready and can be interfaced with IoT platform. This is an option.
- **Digital Twin:** Digital twin is available for all mechatronics system as an option.
- Approach to the design, construction, training and future ready concepts aligned with European and American educational system
- **Train on Automation in Circuit:** Understand how automation works - from simple to complex circuits
- **Train on Automation in Application:** Understand how automation works in industries - from simple to complex applications, programming & control
- Train on Automation in Maintenance: Understand how to identify faults and troubleshoot in automation -variety of exercises to train in this area
- **SKILLON365:** Online courseware that gives the users flexibility of selecting courses from a variety of technologies and changeable each year.
- Tesca modules are built for durability, robustness and performance, high quality and aesthetic finish
- **Highly reliable components:** Pneumatics from Festo, PLC from Siemens, Sensors for reputed international manufacturers, Mechanical components from reputed international industrial suppliers
- **Serviceability:** We support our product globally through our reselling partners and through "Going Digital with Tesca" platform, where you can connect with our service specialists through asynchronous communications or synchronous communication means

Note: Specifications are subject to change.

### Tesca Technologies Pvt. Ltd.

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**Specifications:**

1. Each station is mounted an aluminum profile plated that is placed on a mobile trolley and fitted with PLC as required by the station. Aluminum Profile Plate for mounting all pneumatic & other components to the modules. All electrical and electronic items shall be housed in the cabinet of the trolley below the platform."
2. Operating console with Push button for start, stop, two way selector switch, power switch, emergency stop button - **1 No.**
3. Dimensions 620(W) x 400(D) x 980(H) mm
4. Power Supply Unit with - **1 No.**  
 Input Voltage: 110V & 48A, 50/60 Hz, Single Phase  
 Output Voltage: 24V DC  
 Output Current: 4.5A  
 with short circuit protection
5. Fully wired & Programmed PLC Unit is provided with
  - a) Siemens PLC S7-1200 CPU - **5 Nos.**  
 Digital Inputs: 14 (Minimum) 24 VDC Digital Outputs: 10 (Minimum) 24 VDC Analog Inputs: 2 (Minimum) 0 to 10v Profinet interface communication
  - b) Communication cable - **5 Nos.**
  - c) PLC Programming Software - TIA Portal Basic (v13 sp1):Programming Language: Comply IEEE programming language capability. - **5 Nos.**
6. Service Unit: FRL Unit with pressure regulator, pressure gauge with maximum pressure 10 bar. Shut off valve will be provided with FRL. Switch Knob will be provided in all stations. - **1 No.**
7. Work pieces - **1 Unit**  
 Nylon Bottles with Two colors (34 mm dia x 40mm height) - **20 Nos.**  
 Rejection Bottles (Metal & nylon bottles with different heights) - **6 Nos.**  
 Caps (34 mm dia x 8 mm height) - **20 Nos.**
8. Electrical Cabinet: - **1 No.**  
 Accessible electrical connection terminal box with power input and coded I/O.  
 Industrial communication with others station via standard communication protocol.  
 Communication interface: Ethernet port.  
 Include hard wired and PLC program (manual and auto mode operation)  
 Communication interface: Ethernet port.  
 All wiring cables are properly identified and labelled at both ends.  
 All pneumatic cables and tubing are properly identified and labelled at both ends.

**Station 1: 54033 Distribution Station**

The Station consists of the following items

Dispensing Module: The container is dispensed from the stack.

**Specification:**

1. Double acting pneumatic cylinder - **1 No.**  
 5/2 Single acting solenoid valve : 1  
 Reed switches : 2  
 Horizontal stroke : 50mm Mounting  
 : Allen screw Scope of supply  
 Pneumatic module
2. "Rotary Pick and Place(RPP) Module: The rotary arm picks up the workpiece from the Distribution station and places it in the Testing station for testing operations. - **1 No.**  
**Specification:**  
 Double acting pneumatic cylinder : 3  
 5/2 Single acting solenoid valve(CPV) : 1  
 5/2 Double acting solenoid valve(CPV) : 2  
 Reed switches : 4  
 Rotation angle : 180°( Freely Selectable up to 270°)  
 Vertical stroke : 50mm  
 Mounting : Allen screw  
 Scope of supply Pneumatic module Air supply module
3. Controller : S7-1200 - **1 No.**
4. Technical Literature: Exercise Manual - Training Document for Distribution Station - **1 No.**
5. Reference Manual - **1 No.**
6. W x D x H - 620 x 400 x 1475 mm
7. Weight - 59 kg

Note: Specifications are subject to change.

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8 Packed L x W x H	:	700x 500 x 1700 mm
9 Packed weight	:	95 kg

### Station 2: 54033 Testing station - 1 No.

The station consists of the following items

1. Testing Module - It consists of potentiometer to identify the Height of - **1 No.** the Workpiece. An inductive sensor and a Capacitive sensor is used to identify the workpiece whether it is a metal or non-metal.

#### Specification:

Double acting pneumatic cylinder	:	2
5/2 Single acting solenoid valve (CPV)	:	1
5/2 Double acting solenoid valve (CPV)	:	1
Reed switches	:	4
Horizontal stroke	:	80mm
Vertical stroke	:	80mm
Mounting	:	Allen screw

#### Scope of supply

Pneumatic module  
Air supply module"

2. Rejection Module: It is used to reject the work piece. - **1 No.**

#### Specification:

Double acting pneumatic cylinder	:	1
5/2 Single acting solenoid valve (CPV)	:	1
Reed switches	:	2
Horizontal stroke	:	30mm
Mounting	:	Allen screw

#### Scope of supply

Pneumatic module

3. Conveyor Module: Transfers the work piece from Testing module to Gravity Feeder module. - **1 No.**

#### Specification:

Motor	:	12 V DC power motor
Length	:	330mm Height : 43mm Width : 39mm"1Tesca

- 4 Gravity Feeder: It is used to move the workpiece to the next station. As the workpiece moves on the conveyor, it moves on to the gravity feeder that allows the workpiece to slide into the Rotary Indexing table in the processing station - **1 No.**

- 5 Controller : S7-1200 - Siemens

- 6 Exercise Manual - Training Document for Testing Station - **1 No.**

- 7 Reference Manual - **1 No.**

- 8 W x D x H - 620 x 400 x 1500 mm

- 9 Weight - 64 kg

- 10Packed L x W x H - 700 x 500 x 1750 mm

- 11Packed weight - 103 kg



### Station 3: 54033 Processing Station

The station consists of the following items -

1. Rotary Indexing Module: 6 Position Rotary Indexing Table for holding - **1 No.** Workpiece. Sensor for detecting the presence of Workpiece is provided.

#### Specification:

Motor	:	12 V DC power motor
Position	:	6

2. Volumetric Filling Module: The Filling of the bottle with beads is executed here. - **1 No.**

#### Specification:

Double acting pneumatic cylinder	:	1
5/2 Single acting solenoid valve (CPV)	:	1
Reed switches	:	2
Horizontal stroke	:	50mm
Mounting	:	Allen screw

#### Scope of supply

Pneumatic module" 1 Tesca

- 3 Capping Module: The bottle is capped after it is filled with the beads. - **1 No.**



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This module can also be placed in the buffer station.

**Specification:**

Double acting pneumatic cylinder	:	2
5/2 Single acting solenoid valve (CPV)	:	1
5/2 Double acting solenoid valve (CPV)	:	1
Reed switches	:	4
Horizontal stroke	:	50mm
Vertical stroke	:	40mm
Mounting	:	Allen screw

**Scope of supply**

Pneumatic module

4. Rotary Pusher: A pusher arm pushes the workpiece from the indexing table to the gravity feeder to move it to the next station - **1 No.**
5. Gravity Feeder with pneumatic arm: It is used to move the workpiece to the next station. An arm pushes the workpiece on to the gravity feeder, that allows the workpiece to slide into the Rotary Indexing table in the processing station - **1 No.**
6. Controller : S7-1200 - Siemens
7. Exercise Manual - Training Document for Processing Station - **1 No.**
8. Reference Manual - **1 No.**
9. W x D x H - 620 x 400 x 1500 mm
10. Weight - 71 kg
11. Packed L x W x H - 700 x 500 x 1750 mm
12. Packed weight - 109 kg

**Station 4: 54033 Buffering Station**

The station consists of the following items

1. Buffer module: It has two blockers to buffer the bottles and to ensure there is a sequential flow in sorting the bottle. - **1 No.**

**Specification:**

Double acting pneumatic cylinder	:	2
5/2 Single acting solenoid valve (CPV)	:	2
Reed switches	:	4
Horizontal stroke	:	30mm
Mounting	:	Allen screw

**Scope of supply**

Pneumatic module

2. Conveyor Module : Transfer the workpiece between stations and the buffer module.
 

Motor	:	12 V DC power motor
Length	:	330mm Height : 43mm Width : 39mm
- 3 Controller : S7-1200 - Siemens
- 4 Reference manual - **1 No.**
- 5 Exercise Manual- Training document for Buffering Station - **1 No.**
- 6 W x D x H - 620 x 400 x 1250 mm
- 7 Weight - 58 kg
- 8 Packed L x W x H - 600 x 850 x 1500 mm
- 9 Packed weight - 94 kg



**Station 5: 54033 Sorting Station**

This station consists of:

1. Transfer Module: The transfer module slides the workpiece from the buffer conveyor to the sorting conveyor, when the presence of workpiece is sensed by a sensor - **1 No.**
2. Sorting Module: A color sensor detects the color of the bottle placed on the conveyor and Bottles of specific color are pushed from the conveyor into the chute. - **1 No.**

Double acting pneumatic cylinder	:	1
5/2 Single acting solenoid valve (CPV)	:	1
Reed switches	:	2
Horizontal stroke	:	30mm
Mounting	:	Allen screw

**Scope of supply**

Pneumatic module



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3. Conveyor Module: Stepper motor is used move the shuttle to different stop positions as described above. Total stroke length: 300mm - **1 No.**  
 Motor : 12 V DC power motor  
 Length : 330mm Height : 43mm Width : 39mm  
 Belt : Nylon fabric belt
4. Rotary Pusher: A pusher arm pushes the workpiece from the indexing table to the gravity feeder to move it to the next station - **1 No.**
4. Gravity Feeder: It is used to move the workpiece to the next station. Allowing the workpiece to slide into the Rotary Indexing table in the processing station - **1 No.**
5. Controller : S7-1200 - Siemens
6. Exercise Manual - Training Document for Sorting Station - **1 No.**
7. Reference Manual - **1 No.**
8. W x D x H - 620 x 400 x 1250 mm
9. Weight - 58 kg
10. Packed L x W x H - 700x 500 x 1500 mm
11. Packed weight - 95 kg

**Station 6: OPTIONAL: Robot Station**

This station consists of:

1. Gravity Feeder for Workpieces - **1 No.**
2. ARISTO Robot - **1 No.**
3. Exercise Manual - Training Document for Robot - **1 No.**
4. Reference Manual - **1 No.**
5. W x D x H for Work Station with Robot placement - 620 x 1000 x 1250 mm
6. Weight for Work Station - 130 kg
7. Packed L x W x H for Box 1 - 700x 500 x 1500 mm
8. Packed weight for Box 1 - 85 kg
9. Packed L x W x H for Box 2 - 1100x 1000 x 1000 mm
10. Packed weight for Box 2 - 200 kg

**NOTE:** Tesca is committed to improving its products and customer experiences. Specifications subject to change to accommodate these improvements.

**REQUIRED EQUIPMENT AT SITE AND UTILITIES TO BE PROVIDED BY THE BUYER DURING COMMISSIONING,**

- Compressor - 100 Liter tank Capacity, 6 to 8 Bar (100 – psi) - 1No
- Desktop computer on network - 1 no. (Need to be arranged by the end-user at site)
- Operating System : Windows 7 Professional or higher
- Intel Core 2 Duo E 4300 with 2 x 1,8 GHz or equivalent, RAM : at least 4 GB
- Graphic Card : NVIDIA Quadro FX 550, at least 1 GB or equivalent
- Two free USB ports
- 1 DVD Drive for software installation,
- Recommended: 19" TFT Monitor

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

**Set of Spares**

- Photoelectric sensor : 3 Nos.  
 Capacitive sensor : 3 Nos.  
 Fuse : 10 Nos.  
 Relay : 2 Nos.  
 Workpieces : 4 Nos.  
 Pneumatic hose : 2 mtr

**Ordering Details**

SN.	Order Code	Details
1.	54033A	Export Packing

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