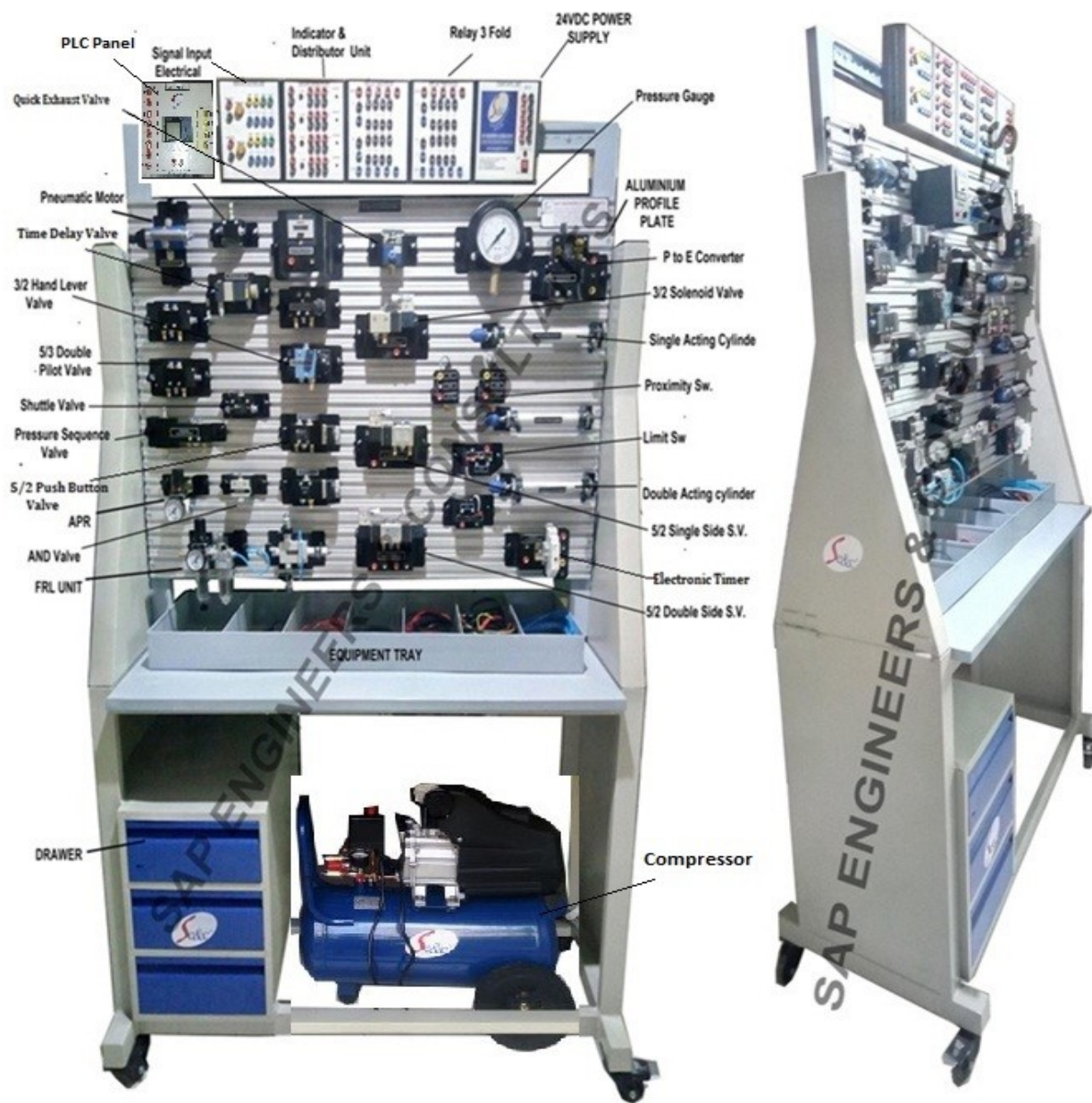


# SAP E & C ADVANCED CUSTOMIZED ELECTRO PNEUMATIC TRAINER (PRODUCT CODE: SAP – 20B)



- The **Advanced Customized Electro Pneumatic Trainer (SAP – 20B)** is capable of being used to demonstrate the design, construction and application of electro-pneumatic components and circuits.
- This Advanced Customized Electro pneumatic simulator is used for imparting training with a variety of different circuits which covers the basic pneumatic system. The simulator and its accessories are suitable for working at 10 bar pressure.
- This trolley mounted simulator structure will have adequate space for proper orientation of valves and cylinders. All the valves and cylinders will be mounted on plate with a provision for fixing hoses through push on connector.
- The components are capable of being mounted on an appropriate profile plate with grooves for secure and flexible positioning so that the components can be clamped firmly, quickly and safely through quick fix adaptors. Industrial components are used in the kit so that the students get hands on practical training in using industrial components.
- The simulator will show the application of linear actuator, speed control circuits, logic control circuits etc.

**Objectives: -**

- ❖ Function & identification of Pneumatic components & their symbols.
- ❖ Direct and indirect manual controls, stroke dependent controls and pressure dependent controls with Different valves.
- ❖ Design & function of Pneumatic System.
- ❖ Functional diagrams.
- ❖ Application and fault findings of Pneumatic controls.
- ❖ To empower students to design their own circuits.
- ❖ The Trainer is Modular & Upgradable
- ❖ Operation & Instruction Manual provided for Operation ease.

**Technical Specification: -**

No.	Item Name	Technical Specifications
01	<b>A] Profile Plates &amp; Stand-</b>  <b>B] Pneumatic Workstation</b>	The anodized Aluminum profile plate is the basis for training. All components fit securely & safely onto the profile plate with safe fixing arrangement, Grid Dimensions: 50mm, Size: 1000 ×700mm  With MS Legs and one pedestal Drawer unit having 4 drawers each with handles & individual locks, on metallic full panel drawer slide: <ol style="list-style-type: none"> <li>1. Work Table – Size Approx. L1200mmxW600mm with four castor wheels including two lockable wheels at front</li> <li>2. Drawer – size Approx – L460mmxW495mmxH158mm each &amp; overall Size of drawer unit (Approx.)- L470mmxW495mmxH825mm</li> <li>3. Drawer Slide Height (Approx.)-85mm</li> </ol>
02	<b>Shuttle Valve (OR)-</b>	<b>Make:</b> JELPC/ JANATICS / kushako/Eqvt <b>QTY:</b> -1 No., ¼ inch B.S.P, The Shuttle Valve is switched through to the output by applying compressed air to one of the inputs (OR) function. Design type is OR gate (shuttle valve). Pressure range: (1-10 Bar)
03	<b>Dual Pressure Valve (AND)-</b>	<b>Make:</b> JELPC/ JANATICS / kushako/Eqvt <b>QTY:</b> -1 No., the dual-pressure Valve is switched through to the output by applying compressed air to both the inputs (AND) Function. Design type is AND Gate (Dual Pressure Valve). Pressure Range: (1-10 Bar)
04	<b>One way flow Control Valve/ flow regulator with check valve Assembly-</b>	<b>Make:</b> JELPC/ JANATICS / kushako/Eqvt <b>QTY:</b> -1 No., the One - way flow control valve is a combination of flow control valve & a non-return valve. The cross section of the restrictor can be set by means of a Knurled screw. Design type is combined flow control Valve. Pressure range – (0.5-10 Bar)
05	<b>Pressure Sequence Valve assembly-</b>	<b>Make:</b> JELPC/ JANATICS / kushako/Eqvt <b>QTY:</b> 1 No., The pressure of the control signal can be set by means of the pressure setting screw (variable). Design type is Poppet Valve with return spring, Operating Pressure range – (1.8 – 8 bar). Control Pr. range - (1 – 8 bar)
06	<b>Single Acting Cylinder with spring return-</b>	<b>Make:</b> JELPC/ JANATICS / kushako/Eqvt <b>QTY:</b> -01 No.: Design type is Piston Cylinder. Operating Pressure 10 bar. Stroke length–100mm
07	<b>Double Acting Cylinder-</b>	<b>Make:</b> JELPC/ JANATICS / kushako/Eqvt <b>QTY:</b> -01 No., Design – Piston Cylinder. Operating Pressure – 10 bar, Stroke Length – Max 100 mm,

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08	<b>Manifold Assembly-</b>	<b>QTY:</b> - 1 No., Manifold with 6 (2 ×3) Hex-Ball Valve. A common manifold for plastic tubing allows supply of compressed air to the control via six individual ports (for plastic tubing PUN 6×0.75)
09	<b>Filter regulator (AFR/FRL) with Gauge-</b>	<b>Make:</b> JELPC/ JANATICS / kushako/Eqvt <b>QTY:</b> -01 No., Filter control valve with pressure gauge, gate valve, quick push-pull connectors & quick couplings mounted on a swivel support. The filter with water separator removes dirt, pipe sinter, rust & condensed water. The pressure control valve regulates the supply. Air pressure to the set operating pressure & compensates pressure fluctuations. The filter bowl has a condensate drain valve. The shutoff valve ventilates & vents entire control. Input pressure –Maximum (16 bar), Output pressure – Max 12 bar, grade of filtration– 40 mm approx., Connector – G 1/8, / PU 6
10	<b>Relay, Three-fold-</b>	<b>QTY:</b> -01 No., the device has three relays with terminals and two buses for power supply. Contact set – Single change-over switches, Contact load – maximum 5 A
11	<b>Signal Input, Electrical-</b>	<b>QTY:</b> -01 No., The device contains an illuminated push-button switch (control switch) & two illuminated push buttons (momentary contact switches) with terminals & two buses for power supply. Contact set- 2 makes, 2 breaks, Contact load- max 1A.
12	<b>Indicator &amp; Distributor Unit, electrical-</b>	<b>QTY:</b> -01 No., The device contains an acoustic indicator and four lamps with terminals and three buses for power supply. Through-contact socket pairs per lamp allow the element to also be used as a Distributor.
13	<b>Proximity switch with attachment-</b>	<b>QTY:</b> -02 Nos., Type: Inductive 2 wire, Diameter: 18 mm, Sensing Distance: 5 mm. The Proximity switch consists of a sensor, the mounting kit and the cable. This proximity switch gives a signal when it detects a metal. The status is indicated by an LED. Switching Voltage – 24 VDC, switching current – max. 200 mA, Switching Power – 6 W approx., switching accuracy - ±0.1mm
14	<b>Equipment Tray-</b>	<b>QTY:</b> 1 No., MS powder coated tray with slots for placing components to be supplied with Electro-pneumatic supplementary kit.
15	<b>5/2-way single sided Solenoid Valve with LED-</b>	<b>Make:</b> JELPC/ JANATICS / kushako/Eqvt <b>QTY:</b> -01 No., The status is indicated by an LED on the housing. The valve is equipped with a manual override. Pneumatic Technical data: Design type is spool valve, pilot controlled with return spring, Pressure range: 250-800 KPa (2.5-8 bar), Electrical Technical data: Power consumption – 1.5 W
16	<b>5/2 Solenoid Valve, Double sided with LED-</b>	<b>Make:</b> JELPC/ JANATICS / kushako/Eqvt <b>QTY:</b> -01 No., The statuses are indicated by LEDs on the housings. The valve is equipped with two manual overrides. Pneumatic Technical Data: Design-spool valve with pilot control, Pressure range – 150-800KPa (1.5-8 bar) Electrical Technical Data: Power Consumption – 1.5 W
17	<b>Pneumatic – Electric convertor-</b>	<b>Make:</b> Orion/Eqvt <b>QTY:</b> -01 No., The pneumatic – electric convertor can fulfill 3 functions: Pressure Switch, Vacuum Switch and Differential Pressure Switch. <b>Pneumatic Technical Data-</b> Pressure Ranges: Pressure Switch connector, P1: 0.25 to 3.5bar, Vacuum Switch: -0.2 to -0.8 bar, Differential Pressure Switch: Connector, P2 - (-0.95 to 3.5 bar)
18	<b>Limit Switch, Left Actuated-</b>	<b>QTY:</b> -01 No., The electrical limit switch comprises a mechanically operated micro-switch. When the roller lever is pressed, for example, by control cam of a cylinder, the micro-switch is actuated. The circuit is closed or opened via the contacts. The micro-switch can be wired as a normally open or normally closed or changeover contact.



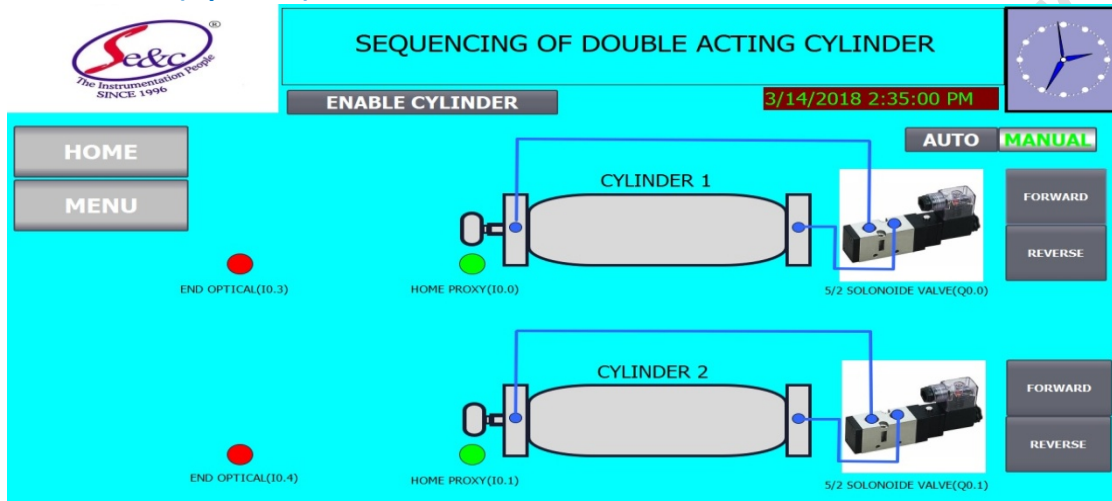
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		Contact load: maximum 5A, switching frequency: maximum 200Hz, Reproducible accuracy: 0.2mm, Switch travel: 2.7 mm, Actuator force: 5N
19	Limit Switch, right actuated-	<b>QTY:</b> -01 No., The electrical limit switch comprises a mechanically operated micro-switch. When the roller lever is pressed, for example, by control cam of a cylinder, the micro-switch is actuated. The circuit is closed or opened via the contacts. The micro-switch can be wired as a normally open or normally closed or changeover contact. Contact load: maximum 5A, switching frequency: maximum 200Hz, Reproducible accuracy: 0.2mm, Switch travel: 2.7 mm, Actuator force: 5N
20	Plug in adapter-	For mounting components with plug-in foot on the aluminum profile plate.
21	Power Supply Unit-	<b>QTY:</b> -01 No., Input Voltage: 230 / 115 VAC (47 - 63 Hz.), Output Voltage: 24 V DC, short circuit proof, output current: Max. 4.5 A, Connection Cable – 3m
22	3/2 Solenoid Valve, Single with LED-	<b>Make:</b> JELPC/ JANATICS / kushako/ Eqvt <b>QTY:</b> -01 No., The status is indicated by an LED on the housing. The valve is equipped with a manual override. Pneumatic Technical data: Design type is spool valve, pilot controlled with return spring, Pressure range: 250-800 kPa (2.5-8 bar), Electrical
23	Quick Push-Pull connectors	Sufficient shall be supplied for branching of the tubing for making of the circuitry
24	Plastic Tubing-	PUN 6×0.75, Exterior Diameter-6mm, Interior Diameter- 4mm, Transparent-10mtrs/Blue-10mtrs
25	Set of molded Cables-	1/1.5 Meter (1 core): Red- 08 Nos, Black- 08 Nos. Yellow- 03 Nos. BS5 Patch cords: Red - 5 Nos. (Approx. 300mm), Black - 5 Nos. (Approx.300mm)
26	Hand Lever Operated Valve	<b>Make:</b> JELPC/ JANATICS / kushako/ Eqvt <b>QTY:</b> -01 Nos. each, <b>3/2 Hand Lever</b> Operated Valve -1 No. & <b>5/2 Hand Lever</b> operated Valves-1 No. each Connection: ¼" Connection. Design type is spool valve. Actuation using Hand Lever.
27	3/2 or 5/2 Push Button Operated Valve.	<b>Make:</b> JELPC/ JANATICS / kushako/ Eqvt <b>QTY:</b> 01 No. Connection: ¼"/ 1/8" B.S.P Connection. Design type is spool valve. Actuation using Push Button.
28	Quick Exhaust Valve	<b>Make:</b> JELPC/ JANATICS / kushako/ Eqvt <b>QTY:</b> 1 No. ¼" Connection
29	Pneumatic Motor	<b>QTY:</b> -01 No., Unidirectional, Air pressure: 0-90 psi.
30	3/2 Pilot operated valve	<b>Make:</b> JELPC/ JANATICS / kushako/ Eqvt <b>QTY:</b> -01 No., 3/2-way Valve, ¼" Connection
31	APR with Gauge	<b>Make:</b> JELPC/ JANATICS / kushako/ Eqvt <b>QTY:</b> -01 No.,
32	Pressure Gauge	<b>QTY:</b> 1 NO, up to 4 bar pressure.
33	Time Delay Valve	1 No. Connection: ¼" Connection, 24V DC/230 V AC Operated.
34	2 positions both side pilot Valve (Optional)	<b>Make:</b> JELPC/ JANATICS / kushako/ Eqvt <b>QTY:</b> 1 NO, ¼ inch B.S.P, 5 ports
35	3/2-way roller operated Valve (Optional)	<b>Make:</b> JELPC/ JANATICS / kushako/ Eqvt <b>QTY:</b> 1 NO, 1/8-inch B.S.P Connection,
36	PLC Panel (Optional)-	<b>Make:</b> Siemens Logo / A-B MICRO 810 Equivalent, <b>QTY:</b> 1 NO, DI: 8, DO: 4, IP/OP LED indication on front Facia of the panel.
37	Electronic Timer (Optional)-	1 No., Power Supply -24VDC with C, NO, NC terminals
38	Air Compressor (Optional)-	<b>QTY:</b> 1 NO, Tank capacity: 20/24 Liters, Discharge: 2 CFM, MOTOR: 1 H.P./ 2 H.P, 1φ, 230 V AC Operated, Working pressure: 5-6 kg/cm <sup>2</sup>
39	Pneumatic Simulation Software (Optional)	<b>QTY:</b> 1 NO, <b>Pneumatic Simulation Software (Optional)</b>

**Note:** We will also provide headers, fitted with push on connector and other necessary fittings which would be required to develop the different said pneumatic circuits. Apart from the above we will also supply sintered bronze silencer, push on connector for 6 mm O.D tube, headers fitted with push on connectors and 6 mm O.D nylon tube of adequate length and necessary fitting

### Simulation Software (Optional):



### Range of experiments:

- ❖ Study of Advanced Electro – Pneumatic Trainer.
- ❖ Study of Self Reciprocation of Single Acting Cylinder by Using Electric Limit Switch & 3/2 Solenoid Valve
- ❖ Study of Self Reciprocation of Double Acting Cylinder by Using Proximity Switch & 5/2 Double Sided S.V.
- ❖ Study of Self Reciprocation of Double Acting Cylinder by Using Proximity Switches & 5/2 Single Sided S.V.
- ❖ Study of AND Valve (Dual Pressure Valve)
- ❖ Study of Shuttle Valve (OR Valve)
- ❖ Study of Quick Exhaust Valve
- ❖ Study of operation of Hand Lever Valve (3/2 & 5/2 DCV)
- ❖ Study of operation Of 3/2 or 5/2 Push Button Valve
- ❖ Study of operation Of 3/2 Single Pilot Operated Valve
- ❖ Study of operation Of Time Delay Valve
- ❖ Study of Pressure Sequence Valve
- ❖ Study of Flow Control Valve & Pneumatic Motor
- ❖ Study of P To E Converter
- ❖ Study of using Signal Input Electrical Box, Relay Three-Fold, Indicator & Distributor Unit
- ❖ Study of Pneumatic & Electro-Pneumatic Circuits.

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**Features: -**

- ❖ Function & identification of pneumatic components & their symbols.
- ❖ Direct and indirect manual controls, stroke dependent controls, time dependent and pressure dependent controls with different valves.
- ❖ Design & function of pneumatic System.
- ❖ Functional diagrams.
- ❖ Logic AND/OR function to start signals.
- ❖ Application and fault findings of Electro Pneumatic controls.
- ❖ Application and fault findings of Pneumatic controls.
- ❖ Pneumatic power section.
- ❖ To empower students to design their own circuits.
- ❖ The kit is modular and upgradeable.
- ❖ Training literature – Instruction & operation manual, troubleshooting & maintenance tips will be provided in soft copy as well as hard copy format

**System Dimension:** 4 Ft. (L) X 2 Ft. (W) X 6.5 Ft. (H)

**Weight:** Approx. 110 Kg

**Services Required:**

- ❖ Compressed clean, dry air supply at 4-5 Kg/cm<sup>2</sup>.
- ❖ Electric Supply of 1 $\phi$  230 VAC, 6A, 50Hz.

**Note:**

All descriptive matter and illustrations are intended to give only a general idea of the equipment Detailed specifications may be altered at the company's discretion without any notice.

