PHOTO: Pneumatics Training Kit
(image for reference only, actual product may differ)

SYSTEM OVERVIEW

The **Pneumatics Training Kit** is a compact, transportable laboratory system designed for hands-on instruction in pneumatic, electro-pneumatic and PLC-interfaced pneumatic systems. The kit uses low-power miniature pneumatic/electrical components (2 mm socket connections) mounted on a slim aluminum profile practice panel housed inside a reinforced portable case with a foam organizer and damper-assisted opening/closing. Components are modular and snap-mountable at arbitrary positions using a 2-way one-touch clamp and cam/spring clamp mechanism, enabling exercises spanning pure pneumatic circuits, solenoid control, sensor feedback, timing and sequencing, and electro-pneumatic integration. The kit includes a service unit with filtration and pressure regulation, a portable oil-less compressor, a range of cylinders, valves, sensors, relay/timer/counting modules, tubing and cabling — all intended for classroom and skill-development laboratory use.

Note: Specifications are subject to change, Photos shown above are Indicative, Actual Product can Vary.

TECHNICAL SPECIFICATIONS

Sl. No.	Item Name	Technical Specifications
1	Portable case with profile panel	Aluminum-extrusion profile plate 700 × 450 × 12 mm mounted in portable case approx. 730 × 495 × 132 mm. Slot pitch 25 mm. Tolerances: ±10 mm case/profile, ±2.5 mm slot pitch, ±2 mm plate thickness.
2	Service unit (FRL)	Regulator + filter 5 µm + shut-off, water trap. Max pressure 1.0 MPa. Port thread M5 × 0.8. Snap-in mounting.
3	Single-acting cylinder	Piston dia ≈10 mm, stroke ≈45 mm. Magnetic piston. Rod S45C. Operating pressure 0.06–0.7 MPa. Rubber cushion. Speed 50–750 mm/s.
4	Double-acting cylinder (with cushion & one-way flow control)	Piston dia ≈10 mm, stroke ≈45 mm, magnetic piston, S45C rod. Operating pressure 0.06–0.7 MPa. Speed 50–750 mm/s. Flow control: orifice 1.5 mm^2, free flow 100 L/min, pressure 0.1–0.7 MPa, needle 8 turns.
5	Double-acting cylinder (with proximity switch)	Same as item 4. Proximity switch: 12–30 V DC, load ≤500 mA, 10 W, accuracy ±0.1 mm.
6	5/2-way single-solenoid valve manifold	4 valves on 8-station manifold. Cv P→A/B 0.16, A/B→EA/EB 0.18. Pressure 0.15–0.7 MPa. Switching freq 10 Hz. Power 0.4 W. Response ≤12 ms.
7	5/2-way double-solenoid valve manifold	4 valves on 8-station manifold. Cv 0.16/0.18. Pressure 0.1–0.7 MPa. Power 0.4 W. Response ≤10 ms.
8	Quick exhaust valve	Effective area IN→OUT 4 mm^2, OUT→EXH 5.8 mm^2. Pressure 0.1–0.7 MPa.
9	Push-button switch set 1	Two push buttons + maintained switch. Contact 2a-2b. Rating 2 A. 2 mm safety sockets.
10	Push-button switch set 2 (E-stop)	Two push buttons + latching E-stop. Contact 2NO-2NC. Rating 2 A. 2 mm safety sockets.
11	Pressure regulator	Relieving type with gauge. Max pressure 1.0 MPa. Flow ≥800 L/min @ 0.6 MPa.
12	Digital time relay	Adjustable 1–99 s. Delay ON/OFF. Contact rating 2 A.
13	Digital totalizing counter	4-digit display. Electrical input + manual reset. 1C contact, 2 A.
14	Limit switch	24 V DC. Contact rating 10 A. Repeat accuracy 0.2 mm. Contact travel 2.7 mm. Operating force 5 N.
15	Triple relay module	Three 4-pole changeover relays (4C). Rating 2 A. LED indication.
16	Power supply	Input 220 V AC, 60 Hz. Output 24 V DC, 2.2 A.
17	Photoelectric sensor set	Through-beam sensors. Range 0–140 mm. N/O PNP output. Output current 50–100 mA. Operating –25 to +55 °C.
18	Inductive sensor set	Ø12 mm sensors. Sensing distance 2 mm. Supply 10–30 V DC. N/O PNP. Max 200 mA.
19	Plastic tubing	ID 2.5 mm, OD 4 mm. Bend radius 10 mm. Max pressure 0.8 MPa. Total length 10 m.
20	Electrical cable set	2 mm cables: Red, Blue, Black assorted lengths (50–500 mm).
21	Stop plugs	Ø4 mm plugs for unused solenoid ports.
22	Portable compressor	Oil-less compressor. Max pressure 0.4 MPa. 1/5 HP. Air delivery 25 L/min.

Note: Specifications are subject to change, Photos shown above are Indicative, Actual Product can Vary.

RANGE OF EXPERIMENTS

- Basic pneumatic circuit construction and troubleshooting using tubing and fittings.
- Single-acting and double-acting cylinder control (extend/return sequencing, cushioning, speed control).
- Valve actuation and manifold experiments (5/2 single & double solenoid valve behavior, manual override).
- Flow control experiments (meter-out / one-way flow control — needle adjustments and effect on speed).
- Quick-exhaust and rapid-transfer behavior for speed optimization.
- Electro-pneumatic circuits: solenoid coil control, lamped push-buttons, emergency-stop logic.
- Sensor integration: proximity, inductive and photoelectric sensing for position detection and interlocks.
- Timing and counting: digital time-relay experiments and totalizing counter integration.
- Relay logic switching and interfacing with external 24 V DC control circuits.
- Practical exercises on mounting, snap-in installation, tubing/wiring practices and safety procedures.
- Compressor and service unit operation: filtration, pressure regulation and water trapping.

FEATURES

- Compact, portable case with reinforced aluminum profile practice panel and foam organizer for neat storage.
- Modular snap-in components with 2-way one-touch clamp and cam/spring clamp for quick reconfiguration.
- Low-power electrical connections using 2 mm safety sockets for student-safe wiring.
- Components include cylinders with magnetic piston rings for sensor mounting, flow control valves, solenoid valve manifolds, timers, counters and relay modules for broad hands-on coverage.
- Built-in service unit (filter/regulator/water trap) for clean, regulated air supply.
- Compatible with external devices and PLC interfaces for extended electro-pneumatic experiments.
- Damper-assisted case opening for safe transition between storage and working positions.
- Oil-less portable compressor included for independent operation in classroom environments.

Note: Specifications are subject to change, Photos shown above are Indicative, Actual Product can Vary.

SERVICES REQUIRED

- Standard **230 V AC** power supply
- Proper earthing/grounding required

➢ ***Note: All specifications are subject to revision without notice. Depicted images are for reference only and may not represent the actual product.***