



The PC-PID Based Multi Process Control Trainer is highly flexible and modular system for studying of various control loops in industrial processes. It has been designed to include these processes in a single structure. The system in fact includes transducers, transmitters, PID controllers, actuators, + computerized control with SCADA application Software.

**KEY WORDS:**

- Feedback Control.
- Feedback Flow Control.
- Feedback Level Control.
- Feedback Pressure Control.
- Feedback Temperature Control
- Cascade Control (Level + Flow, Pressure + Flow)
- Ratio Control (Flow + Flow).
- Split Range Control
- Feed forward control(optional): flow/level

**TECHNICAL SPECIFICATION**

Sump tank	1 no., Material: SS 304 1.5 mm thick / PP 5mm thick, with top cover, Capacity: 50 liters , Dimensions : 2 ft (L) ×1 ft (W) ×1.5 ft (H).
Level Tank	1 no., Material: Acrylic/ P.P. 5 mm thick , with top cover, Dimensions: 150mm (L) ×150mm (W) × 500mm (H).
Temperature Cabinet/ Process Tank-	1 no., Process tank with thick insulation wall & Electric Heater Thermostat, Heater: 3 KW, Dimension: 1ft (L) ×1ft (W) ×1.25ft (H).
Centrifugal Pump	2 nos., ½ / 1 H.P., 1f 230 V AC supply, Surface mounting.
Pressure vessel	1 no., Shape: Cylindrical, Material: CRCC /SS 304, Diameter: 150 mm, Length: 300 mm, Capacity: 15 Kg/cm <sup>2</sup> , with ½" BSP connection for Pressure Gauge, Pressure Transmitter, Inlet & Drain facility
Piping	½" Class B GI with ½" ball valves: 17 nos.
Flow meter	2 nos. Size: ½", Turbine type (WFM type), Range: 0-600/0-1000 LPH, Supply: 24 V DC, 100 mA. Output: 4-20 mA, Type: 3-wire type Mounting: Horizontal, Connection; ½"
Level Transmitter	1 no., Input: 0-400 /0-500 mm, Output: 4-20 mA, supply: 24 V DC, 100 mA. Type: 2-wire capacitance type, Mounting: Top 2" screwed connection.
Pressure Transmitter	1 no., Input: 0-2.5 Kg/cm <sup>2</sup> or 0-4 Kg/cm <sup>2</sup> , Output: 4-20 mA, supply: 24 V DC, 50 mA, Type: 2-wire Piezo-resistive type, Medium: Water Pressure. Mounting: Top ½" BSP connection
Temperature Transmitter	1 No., Type: Head mounting, Input: RTD, Output: 4-20 mA, Type: 2-wire type, Range: 0-100° C.
Thyristered Phase Angle Control Card-	1 No. Input: 4-20 mA, Output: 0-230 VAC variable, 10 A Max.
Pneumatic Control Valve	2 no. Size: ½", Characteristics: Equal percentage, Type: Two way Globe type (Air to Close action for Valve-1 & Air to Open/Close Action for Valve -2), Cv : 5 US GPM, with diaphragm actuator. Flange connection: PCD: 80 mm, ID: 26 mm, OD: 110 mm. Pneumatic Input Signal: 0.2 to 1.0 Kg/cm <sup>2</sup> . <b>With Optional Addition of 2 Nos. Valve Positioner /Electronic Signal Converter 1 No. for Split Range Control.</b> For Electronic Signal Converter- I/P: 4-20mA, Output: 4-20mA on 2 Channels

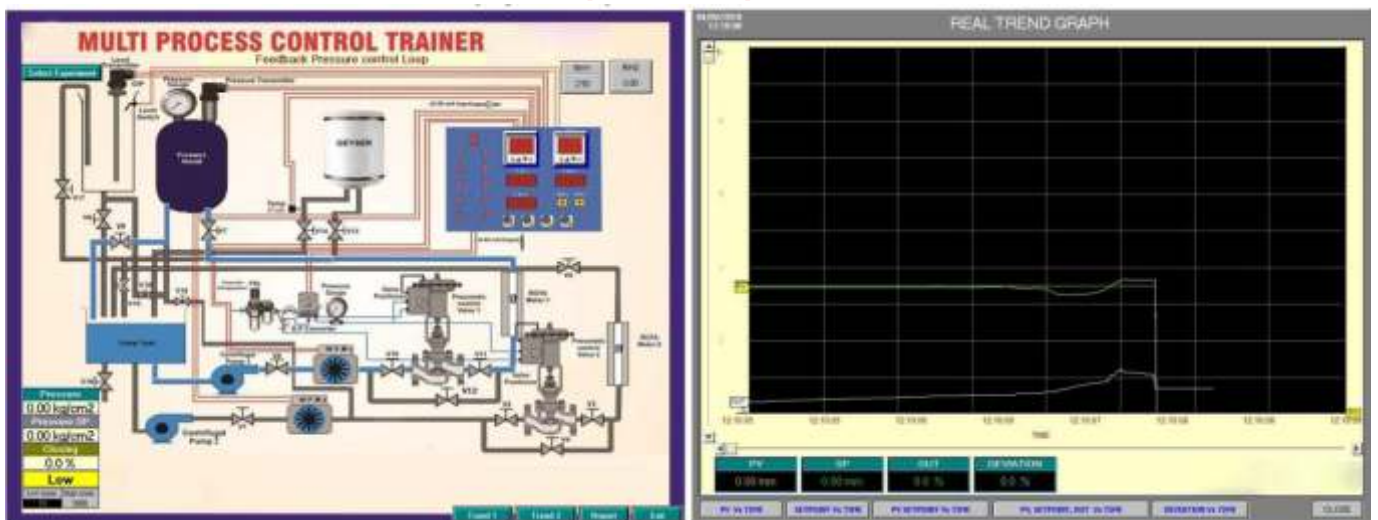
Note: Specifications are subject to change.

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	For Valve Positioner 1 : I/P 0.2 to 0.6 Kg/cm <sup>2</sup> & O/P: 0.2 to 1.0 Kg/cm <sup>2</sup> For Valve Positioner 2 : I/P 0.6 to 1.0 Kg/cm <sup>2</sup> & O/P: 0.2 to 1.0 Kg/cm <sup>2</sup>
Rotameter	2 Nos., Range: 0-1000/0-2000 LPH, Glass tube type/acrylic body, Bob Material: SS 304 Connection: ½", Mounting: Inlet- Bottom, Outlet- Top.
E/P Converter	Input: 4-20 mA, Output: 3-15 psi, Connection ¼" NPT / BSP, Supply 2.1 Kg/cm <sup>2</sup>
A.F.R. / F.R.L. Unit	0-10 Kg/cm <sup>2</sup> with pressure gauge, Connection ¼" NPT / BSP.
Level Switch	Float operated, Float Material; Ss304, Switching voltage: 24 VDC, Switching Current 0.5A, Switch Action; Reversible, Weight: 315 Gms
Current Meters	3 No.s, Range 0-20 mA, Supply: 230 VAC, Cut out: 44mm×92 mm×110 mm.
Isolator	2 No.s, Signal Isolators, Input: 4-20 mA, Output: 4-20 mA, Supply: 230 V AC.
Power Supply	24 V DC, 5 A, Size: 48mm×126mm×68mm.
Electronic PID Controller	2 No., Single input PID & Dual Input PID, with Serial Interface USB / Ethernet / RS 485 / RS 232, Cut Out Size; 92×92×144mm, Input: 4-20 mA Output: 4-20 mA, Display: Dual for PV & SP, Bar graph display for Output & deviation, Hi-Low alarm annunciation.
Electrical Control Panel	MS Powder coated panel with switches, indicator, Test Points, controller on front fascia, UK 2.5, Terminal connectors mounted on DIN rail channel, Use of 0.5 sq mm Multi-strand wire with proper insulated Lugs, Ferruling & neat wire dressing & clamping Wires & power cables are seated through 1"×1"PVC cable tray. Dimension: 1ft (L) ×1ft (W) ×1ft (H).22
52201 Computer (Optional)	PC with color monitor: 18.5", Intel Core i3, 500 GB HDD, 4GB RAM, Keyboard & Mouse, DVD Writer, With supporting OS and Communication port.
52202 SCADA Application Software (Optional)	SCADA S/W, PID control settings (P, PI, PD and PID mode), Auto/Manual Tuning of PID, Data Storage, Off Line analysis, Online Data Acquisition, Simulation and Printing Of data in Graphical and tabular form. Interactive Graphical. User Interface (GUI) included.
52203 Air Compressor (Optional)	Tank capacity: 25 Litres, Discharge: 2 CFM Motor: 2 H.P. 230 V AC Operated working pressure: 5-6 kg/cm <sup>2</sup>

**52202 SCADA APPLICATION SOFTWARE (OPTIONAL) :**



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### Range of experiments-

- Feedback control: - Flow, Level, Temperature and Pressure.
- Cascade control: - Level + Flow, Pressure + Flow.
- Ratio control: - Flow/Flow.
- Split Range control: - Level/Pressure.
- On-Off control: Flow, Level, Pressure, Temperature.
- Study of SCADA Application Software/ Computerized Control of Multi-Process Control System.
- Feed forward control(optional): flow/level (to be incorporated extra on Demand only)

### Process Equipments-

- A sump tank and transparent acrylic tank (secondary) containing water.
- A control system for liquid flow across the two tanks
- A control system for liquid level in secondary tank.
- An Oven/ Process Tank for temperature control.
- A pressure vessel for pressure control.
- Electrical control panel along with PC Interface module.

### Features-

- Compact Ergonomic Design.
- User Friendly, Self Explanatory Systems.
- Leak proof Safety Measures, sturdy piping.
- Enhanced Electrical Safety Considerations.
- Training Manuals mimic Charts for Operation Ease.
- System Frame with Caster Wheel Arrangement for ease in movement.
- M.S. powder coated cubical plant with standard Instrument Mountings.
- Inbuilt Safety Measures to avoid improper usage.
- SCADA software connectivity for analysis of Multi process Trainer.
- Caster wheel mounted movable frame

**System Dimension (Approx.):** 6 Ft. (L) X 2.5 Ft. (W) X 6 Ft. (H)

**Weight:** Approximately 250 Kg

### Services Required:

- Electric Supply of 1φ 230 V AC, 50 Hz.
- Water Supply and Drain Arrangement.
- Clean, dry, compressed air supply at 2.1 kg/cm<sup>2</sup>.
- Laptop/Desktop Computer for SCADA only (
- Printer (Optional).

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