



The Flow Control Trainer is the system, which outlines the basics of Closed Loop Flow Control and various aspects related to it.

**KEY WORDS:**

- Feedback Flow control.
- ON-OFF & PID control.
- OPEN/CLOSE loop response.
- MANUAL/AUTO tuning of controller
- SCADA Based Flow Control
- P, P+I, P+I+D Controller Action.
- TRANSIENT response analysis study.
- USB/RS 232 / Ethernet/ Modbus
- Communication
- Ability to hook up with DCS  
(Distributed Control System Trainer)

**TECHNICAL SPECIFICATION**

Sump tank-	Material: Stainless Steel, 1.5 mm thick /P.P.5mm thick, with top cover, Capacity: 30 liter, Dimension: 1 ft (L) × 1ft (W) × 1 ft (H).
Piping-	1/2" GI, Class B, with 1/2" SS ball valves: 6 No.
Centrifugal Pump-	1/2 HP, 1f 230 V AC supply, Surface mounting
Flow meter-	Type: Turbine Flow Meter Range: 0-600/0-1000 LPH, Output: 4-20 mA, Supply: 24 V DC 100 mA, Mounting: Horizontal, Connection: 1/2."
Pneumatic Control valve-	Size: 1/2", Type: Two way Globe type (Air to Close), Cv: 5 US GPM, with diaphragm actuator, equal% characteristics, Flange connection : PCD 60 mm, ID: 16 mm, OD: 90 mm.
Rotameter	Range: 100-1000 LPH, Glass Tube Type/ Acrylic body. Connection: 1/2", Bob Material- SS 304, Mounting: Inlet- Bottom, Outlet- Top.
E/P Converter	Input: 4-20 mA, Output: 3-15 psi, Connection: 1/4"NPT / BSP, Supply: 2.1 Kg/cm <sup>2</sup>
A.F.R /F.R.L. UNIT-	Air Filter, Regulator & Lubricator, 0-10 Kg/cm <sup>2</sup> with pressure gauge, Connection 1/4" NPT / BSP.
Power Supply	24 V DC, 3 A, Size: 48mm×126mm×68mm.
Electronic PID Controller-	With Serial PC Interface (ASCII/MODBUS Protocol) USB / Ethernet / RS 485 / RS232, for SCADA option only, Cut Out Size: 92mm×92mm×144mm, Input:4-20 mA, Output; 4-20 mA, Display: Dual for PV & SP, High-Low Alarm annunciation, Bar graph display (Optional)
Electrical Control Panel	MS Powder coated panel with switches, indicator, test Points, controller on front facia, UK 2.5 Terminal Connectors mounted on DIN rail channel, Use of 0.5 sq. mm multi-strand wire with proper insulated Lugs, Feruling & neat wire dressing & clamping, Wires & power cables are seated through 1"×1" PVC cable tray. Dimension: 1ft (L) × 1ft (W) × 1ft (H)
52202 SCADA Application Software (Optional)	SCADA Application S/W, PID control setting (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

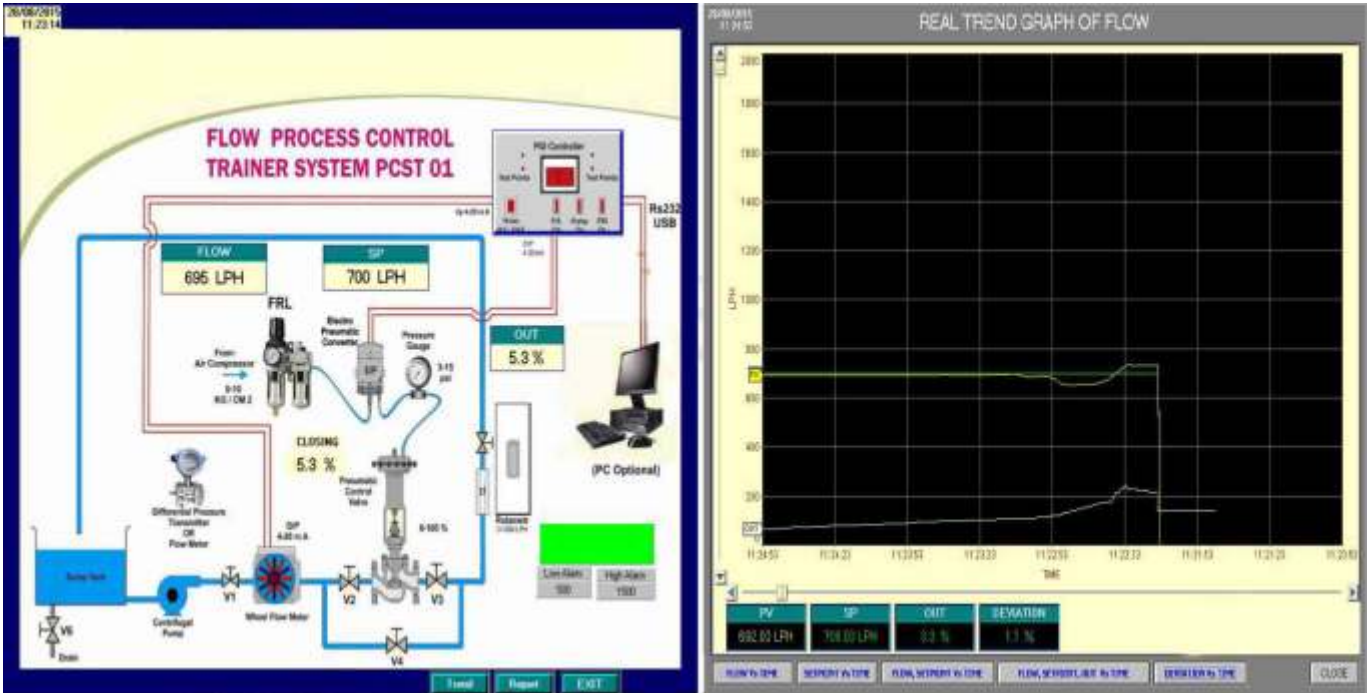
Note: Specifications are subject to change.

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	form. Interactive Graphical User Interface (GUI) included
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.
52203 Air Compressor (Optional)	Tank capacity: 25 Liters, Discharge: 2 CFM, Motor: 1 H.P. 230 V AC Operated, Max. Pressure: 8-10 Kg/cm <sup>2</sup> Working pressure: 5-6 kg/cm <sup>2</sup>

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



**Range of experiments:**

- Study of single loop Proportional (P), Integral (I) and Derivative control (D).
- Study of operation and calibration of transmitters, I/P converter and Control Valve.
- Study of OPEN LOOP/CLOSE LOOP TUNNING & AUTO TUNNING of controller.
- Study of STEP response & Transient response of controller (process curve).
- Study of programming and operation of PID controller.
- Study of stability of single loop Flow Control System.
- Configure microcontroller based controller to give manual output, changing controller modes (Manual/Auto), Checking ON-OFF, Proportional(P), Integral(I), Derivative(D), PI(P+I) and PID (P+I+D) control actions, change local Set point, configure and run a set point ramp, configure measured values to either percentage or Engineering units.
- Auxiliary experiments
- Study of SCADA Application Software/ Computerized Control of Flow Control System.

**Features: -**

- Understand the concept of feedback FLOW control loop.
- User Friendly, Self Explanatory Systems.
- Leak proof Safety Measures, sturdy piping.
- Enhanced Electrical Safety Considerations.
- Training Manual & Mimic Charts for Operation Ease.

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- 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.
- Computer Interface (Optional), SCADA Application software connectivity for analysis of Flow
- Control System Trainer.
- System Dimensions: 4 Ft. (L) X 2Ft. (W) X 4.5 Ft. (H)
- Weight: Approx. 70 Kg
- Services Required:
- Water supply and drainage arrangement.
- Electric supply 1 $\phi$  230 V AC, 50 Hz.
- Clean, dry and dust free Compressed air supply 2.1 kg/cm<sup>2</sup>.
- Laptop/desktop computer (for SCADA)

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