



This trainer is highly flexible and modular system for studying of various feedback and cascade control loops in industrial processes. It has been designed to include these processes in a single structure. The system in fact includes transducers, PID + computerized control with SCADA Software.

**Key Words: -**

- ❖ Feedback Level control.
- ❖ Feedback Pressure control.
- ❖ Feedback Temperature control.
- ❖ Feedback Flow control.
- ❖ Position Measurement.
- ❖ Cascade Control.

**DCS AND SCADA**

Hybrid Controller (AI 8, AO4) & (DI16,DO16), Control Loops 8 with RS 232 & RS 485, Ethernet

**Technical Specifications:**

- ❖ DCS : Hybrid Control Designer
- ❖ SCADA Application
  - Software: - SCADA Wonderware( Ellipse) in Touch 64 Tags, 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.
- ❖ Supply tank: - Material: Stainless Steel 304-2 mm thick / (P.P.5mm thick) , Capacity: 27 liters-2 Nos.
- ❖ Process Tank :- a] SS 304/ (P.P.5mm thick) Material - Capacity 7.5 Liter (0-100%) scale  
b] SS 304/ (P.P.5mm thick) Material - Capacity 7.5 Liter, (0-500mm) Scale
- ❖ RTD : - PT 100 Range 0 to 100°C, 2 Nos.
- ❖ Temperature : - 2 Nos. PT100, Input: RTD, Output: 4-20 mA, Type: 2-wire type, Transmitter Range: 0-100 ° C.
- ❖ DPT :- a] Type 2 wire, Range (0-200mm)H<sub>2</sub>O, O/P (4-20mA), Square Root  
b] Type 2 wire, Range (0-500mm)H<sub>2</sub>O, O/P (4-20mA), Linear
- ❖ GPT :- a] Type 2 wire, Range (0-600mm)H<sub>2</sub>O, O/P (4-20mA),  
b] Type 2 wire, Range (0-2.5 Bar), O/P (4-20mA), Type Electronic, 2 wire, O/P (4-20mA) supply: 24 V DC, 50 mA. Type: 2-wire Piezoresistive type, Medium: Water Pressure.
- ❖ Geyser: - 1'' thick insulation wall, Heater: 1 KW.
- ❖ Piping: - 1'' Class B GI with 1'' SS ball valves
- ❖ Level Transmitter: - DPT, Input: 0-500 mm H<sub>2</sub>O.  
Output: 4-20 mA, supply: 24 V DC, 100 mA.
- ❖ Pressure Transmitter: - GPT, Input: 0-2.5 Kg/cm<sup>2</sup>, Output: 4-20 mA, Mounting: Top ½'' BSP Connection Type: 2-wire.
- ❖ Flow meter: - DPT, TYPE-2 wire, Range-0-200mm H<sub>2</sub>O,  
Output: 4-20 mA, sq.rt.

- ❖ Thyresterized Phase Angle Control Card: - Input: 4-20 mA, Output: 0-230 VAC variable, 10 A Max.
- Position Transmitter:- Type: Electronic, 2 wire, o/p: 4-20 mA.
- Float Switch: Magnetic. 2 Nos.
- Solenoid Valve: 2/2 way normally closed, 1/4 BSP water, 2 Nos.
- ❖ Pneumatic control valve: - 2 no. Size: 1", Characteristics: Equal percentage.  
Type: Two way Globe type with valve (Air to Close) & Linear two way Globe type with valve (Air to Close),  
Cv: 9 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>
- ❖ Rotameter: - 1 no. Range: 40-400 LPH, Glass tube type/acrylic body ,  
Bob Material: SS 304 Connection: 1", Mounting: Inlet- Bottom, Outlet- Top.
- ❖ E/P Converter: - Input: 4-20 mA, Output: 3-15 psi, Connection 1/4" NPT / BSP,  
Supply 1.4 Kg/cm<sup>2</sup>, 2 Nos.
- ❖ Air Filter Regulator: - 0-2.5 Kg/cm<sup>2</sup> with 3 Nos pressure gauges(0-2.5 Kg/cm<sup>2</sup> and 0-7 Kg/cm<sup>2</sup>),
- ❖ Power Supply: - 24 V DC, 1.5 A, Supply: 230V AC.2 Nos.
- ❖ Electronic PID Controller: - 1 No., Single input PID & Dual Input PID,  
with Serial Interface (ASCII Protocol) 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 facia, UK 2.5  
Terminal connectors mounted on DIN rail channel,  
Use of 1sq mm Multistrand 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).
- ❖ Air Compressor: - Tank capacity: 45 Liters, Discharge: 3.8 CFM  
Motor: 1 H.P. 230 V AC Operated working pressure: 10 kg/cm<sup>2</sup>
- ❖ Pump:- Fractional Horse power, centrifugal.
- ❖ Plunger Pump:- Positive displacement plunger pump, capacity: 200 LPH.
- ❖ Flow measurement device:- Orifice meter(3 Nos), Venturi meter.
- Overall Dimensions: 1150mmL×800mmW×1900mmH.

**Features:**

- ❖ Compact Ergonomic Design.
- ❖ User Friendly, Self Explanatory Systems.
- ❖ Leak proof Safety Measures, sturdy piping.
- ❖ Enhanced Electrical Safety Considerations.
- ❖ Training Manuals and 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 given feedback system.

**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 Geyser for temperature control.
- ❖ Electrical control panel along with PC Interface module.
- ❖ ON-OFF Control: Level, Pressure, Temperature.

**Range of experiments:**

- ❖ Feedback control: - Flow, Level, Temperature and Pressure.
- ❖ Study of SCADA Application Software/ Computerized Control of Feedback Control System.

**Services Required:**

- ❖ 230 V Single phase AC Supply, Water Supply and its Drain Arrangement.
- ❖ Clean, Dry, Compressed Air Supply at 2.1 Kg/cm<sup>2</sup>.
- ❖ Printer (Optional).
- ❖ computer

**System Dimensions:** 1150mm X 800mm (W) X 1900mm

**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.

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