

**Tender Notice**  
**Tender No: 06/17-18**  
**Purchase of Equipments for Systems & Control Lab.**

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**Equipment Details with specification**

**1) DC Servomotor Trainer kit**

This System Includes: -

- 100W DC separately excited DC servo motor setup
- Variable AC/DC source with meter setup

**100W Separately Excited DC Servo Motor:**

- Armature voltage : 0-48V DC, 3 Amp
- Field voltage : 0-48V DC
- Shunt type separately excited
- Speed :1500 rpm
- Rating :100W
- One Proximity sensor provided to sense the speed
- One 3½ digital display provided to display the speed
- Double side shot extension with speed indication
- Mechanical loading arrangement

**Variable AV/DC Source:**

- 0-50V/3A variable DC source with short circuit, over load protection for armature voltage variation
- 0-50v/1A DC variable source4 with short circuit, over load protection for field section
- Isolated 0-50V AC/1A variable AC source for motor inductance measurement
- DC digital voltmeter (0-50V) provided for armature voltage measurement
- DC digital ammeter (0-5A) provided for armature current measurement
- (0-50V ) DC digital meter provided for field voltage measurement
- (0-2A) DC digital ammeter provided for field current measurement
- (0-50V)AC digital voltmeter for AC voltage measurement

- (0-5A) AC digital ammeter for AC current measurement
- digital stop-clock provided for time measurement.

## 2) Process Control Simulator

This special purpose analog simulator with operational amplifiers permits a detailed analysis of the first order, second order and 3<sup>rd</sup> order systems and the application of proportional, integral and derivative control to the improvement of their performance. Frequency Response Analysis of PID controller & process can be studied for a range of frequencies (0.5Hz to 1KHz)

### Features:

- Built-in Function Generator (Sine & Square wave)
- Self contained power supplies and power ON/OFF switch
- Simulated distance-velocity lag
- Full mimic diagrams in the front panel
- The simulated process
  - Simple Lag of 10ms, 2 lags of time constant 10ms that can be toggled to integrators of same time constant
  - Distance-velocity lag & delay 10ms
- The simulated PID controller
  - Integral action control scaled in integral action time
  - Derivative action control scaled in derivative action time
  - Proportional band control scaled in % proportional band

### Technical Specifications:

- Process
  - Time constant of simple lags - 10ms (fast) of 1ms (slow)
  - Time constant of Integrators - 10ms (fast) of 1ms (slow)
  - Distance - velocity lag - 10ms
- Controller
  - Set Value Range: - 0 to + 10V
  - Integral action Time range: (Ti) - 250ms to 5 ms (fast); 25s to 0.5s (slow)
  - Derivative action Time range: (Td)- 0-20ms (fast); 0-2 s (slow)
  - Proportional Band (p): - Corresponding to gain constants 0.5 to 25.

## 3) Temperature/ Flow/ Level Control Trainer kit

Product: Temperature/Flow Level Controller

Make : Ark Automation Systems

Model : ARK-PT-62

**Description:**

This trainer is designed to study the basic principles of flow control, Level Control and Temperature. A supply tank is fitted with pump for water circulation. A thyristor power driver provided to control the heater power and pump speed.

**Specifications:**

- Level Transmitter : Type: RF Capacitance/ Piezo Resistive
- Flow Transmitter : Turbine type Flow Sensor
- Power Driver : Type : Thyristor , Control Signal : 4-20 mA,
- Output : 0-200 VAC, Load Upto 3 KW
- Rotameter : Range: (10-100)lph, Make: Eureka/Equivalent.
- Pump : Fractional Horse Power,230v/50 Hz AC.
- Supply Tank : SS304,10Litres capacity.
- Air Regulator : Input: (0-10.6)Bar, Output: (0-2.1)Bar
- Data Acquisition:
  - A power data Acquisition Card
  - 8 Channel, Analog to Digital Converter
  - 2 Channel configured as 4-20 mA input
  - 6 Channel configured as 0-5 VDCs
  - 12-bit resolution
  - Single Channel Digital to Analog Converter.
  - Single Channel configured as 4-20 mA output
  - 12-bit resolution & 8 Digital Inputs
  - 8 Digital outputs & Built in regulated Power supply
  - All signals are terminated in suitable connector
  - RS232C to USB Converter

**4) Differential Synchro System**

Two number of torque differential synchro used as a torque differential transmitter(TDX) and torque differential receiver (TDR)

Rotor Voltage : 50V AC, 50Hz three phase

Induced Stator Voltage : 22V AC, 50Hz three phase

The input and output angular displacement is indicated in a round dial marked with angular position (0-360°)

One no. of Digital AC Voltmeter used to indicate stator/rotor voltage of transmitter (or) receiver

One no. of 230V/50V AC Step-down transformer for rotor voltage input.

## 5) Function Generator

Model: Salicon ST8202

Maker:

### Features:

- Frequency: 0.1 Hz-2MHz
- Output waveform: Sine, Triangle, Square,  $\pm$ Ramp,  $\pm$ Pulse
- Low distortion
- High stability
- Linear and logarithmic sweep function
- Sweep time and width adjustable
- External Voltage Control Frequency (VCF) Internal and External modulation  
AM/FM
- TTL/CMOS compatible signal output

### Specifications:

- Frequency range: 0.1 Hz 2M Hz
- Display: 6 digit LED display
- Output waveforms: Sine, Triangle, Square,  $\pm$  Pulse,  $\pm$  Ramp
- Output Impedance:  $50\pm 10\%$
- Output Amplitude: 20Vp-p(open circuit) , 10Vp-p (with 50 load)
- Amplitude Control: 0dB, 20dB, Fine tune
- DC Offset: 0 to  $\pm 5V$  continuously adjustable
- Symmetry Range: 80:20 - 20:80
- Rising Edge of Square:  $<30ns$