Tesca Technologies Pvt. Ltd.

Order Code : 25268711.3
Introductory Pack for Speed and Position
Control using P, PI, and PID Controllers

System Overview

This advanced training system enables **behavioral analysis of control systems** in diverse configurations. It supports **real-time experimentation** and **theoretical validation** of control laws applied to **servomechanisms** and **regulation systems**.

A suite of laboratory manuals supports in-depth analysis of control principles, making it ideal for academic and research purposes.

Educational Capabilities

The system supports practical study in the following areas:

- **Sensor Analysis:**
  - Position sensors
  - Speed sensors
  - Acceleration sensors
- **System Behavior Comparison:**
  - Open-loop vs. closed-loop in both speed and position control
- **Controller Impact Studies:**
  - P (Proportional), PI (Proportional-Integral), and PID (Proportional-Integral-Derivative) control strategies
  - Tuning effects of control parameters
- **Command Input Analysis:**
  - Influence of command signal types
- **Mechanical Load Simulation:**
  - Impact of varying mechanical load characteristics

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

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Mechanical Assembly

- **Motor:**
  - 24 V DC motor
  - Full technical specifications provided in an accompanying specifications table
- **Coupling & Load Simulation:**
  - Oldham-type flexible coupling
  - Direct connection between motor and generator to simulate mechanical loads
- **Rotational Reference:**
  - Graduated disk for visual monitoring of shaft position and speed
- **Housing:**
  - Compact PVC desktop enclosure
  - Dimensions: **375 × 290 × 100 mm Aprox**

Integrated Control Electronics

- **Microprocessor-Based Control Board:**
  - Real-time processing
  - USB communication with PC for control and data acquisition
- **Power Electronics Board:**
  - Drives the DC motor
  - Armature current regulation for generator-based mechanical load simulation

Front Panel Features

- **Monitoring & Control Interfaces:**
  - 2 × BNC connectors for controller signal observation
  - 2 × BNC connectors for motor voltage and current measurement
  - 1 × BNC input for external setpoint control
  - 1 × internal knob for manual setpoint adjustment
- **Control Elements:**
  - ON/OFF power switch
  - Power indicator LED
- **Visual Aids:**
  - Printed control system block diagram
  - Transparent window for observing internal mechanical components
  - Manual zero-position (origin) setting capability

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