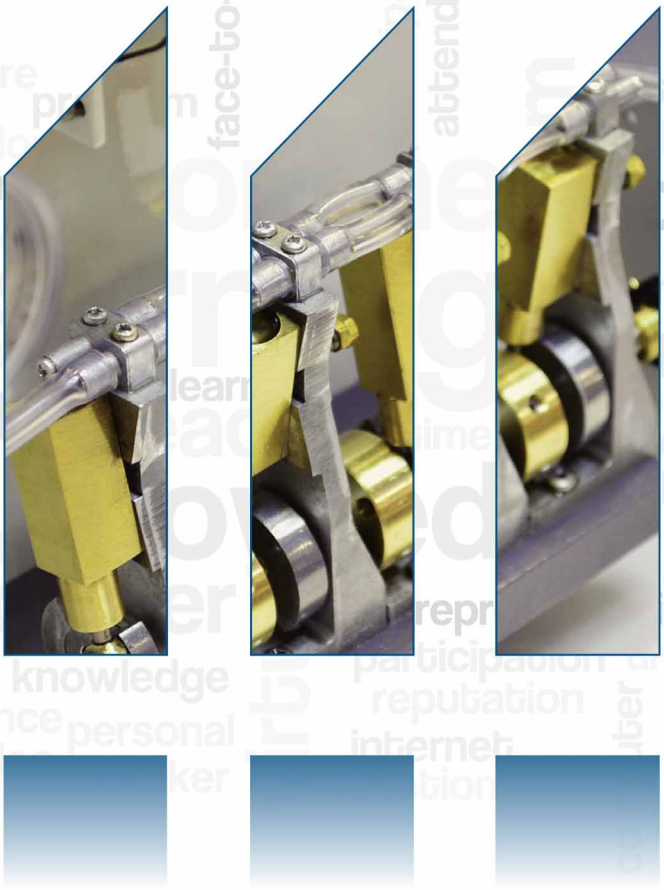

Control Engineering

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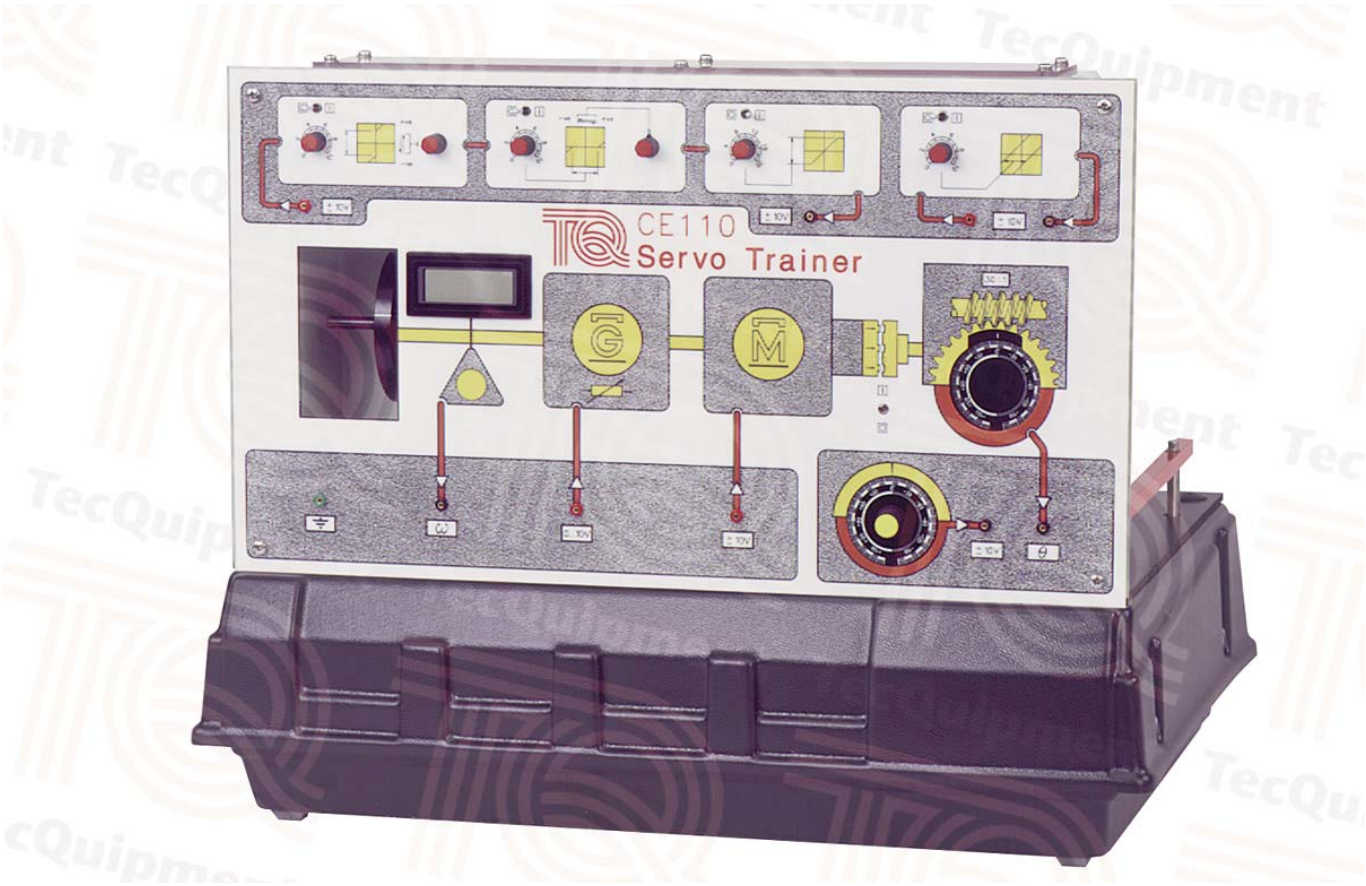
CE110 Servo Trainer

Compact, self-contained, bench-mounting apparatus to study basic and advanced principles of servomotor control



- Self-contained and compact bench-mounting unit
- Ideal for classroom demonstrations and student project work
- Shows problems of speed and position control of a servomotor under different loads
- Mimics industrial, transport and aeronautical problems - with realistic results
- All inputs and outputs buffered for connection to TecQuipment's optional controllers or other suitable controllers
- Front panel includes a mimic diagram of the process so that students can clearly see what they are controlling
- Shows basic control of speed, with advanced studies of non-linear effects of hysteresis, deadzone and saturation

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An ISO 9001 certified company

TecQuipment

CE110 Servo Trainer

Description

The CE110 Servo Trainer shows d.c. servo position and speed control systems using typical industrial techniques. It has a d.c. servomotor, a d.c. generator and a flywheel mounted on a common shaft.

Analogue 0 to ±10 V control signals vary the servomotor shaft speed in either direction. An optical sensor measures the speed and shows it on a panel-mounted digital meter.

The d.c. generator statically or dynamically loads the servomotor.

An electric clutch connects or disconnects the shaft to a 30:1 reduction gearbox for position control studies. A manual control allows the user to set a position control setpoint.

To adjust the shaft inertia, the CE110 comes with two extra interchangeable inertia discs (flywheels).

For advanced experiments, the Servo Trainer includes extra 'block'-type circuits that can add non-linear and fully adjustable effects of:

- Deadzone or 'deadband'
- Anti-deadzone
- Hysteresis
- Saturation

These blocks are important in studies of servo systems because they mimic problems that happen in real applications.

Note: You must use the CE110 with TecQuipment's optional CE120 Controller, the optional CE122 Digital Interface, or other suitable controllers with 10 V inputs and outputs. Details of the CE120 and CE122 are on separate datasheets.

The CE110 includes a set of cables and connectors for connection to other equipment.

All control connections work with 0 to 10 VDC signals.

Essential Base Unit

- Controller (CE120) – A controller with analogue and digital controls and instruments **or**
- Digital Interface (CE122) – An interface which connects between most products in the Control Engineering range and a suitable computer (not included) **or**
- Other suitable controller with 10 V inputs and outputs

  Both the CE120 and the CE122 include TecQuipment's CE2000 Control Software (see separate datasheet) with editable, pre-made control experiments for use with the CE110.

Standard Features

- Supplied with comprehensive user guide
- Five-year warranty
- Made in accordance with the latest European Union directives

Sound Levels

Less than 70 dB(A)

Experiments

- Basic tests and transducer calibration
- Response calculation and measurement
- Proportional and proportional plus integral control of servo-system speed
- Disturbance cancelling and feedforward control
- Angular position control: proportional control and velocity feedback
- Angular position control and the influence of non-linearities
- Non-linear system characteristics

The flexible design of the equipment allows the user to develop many other analysis and control exercises to suit their needs. It is good for extended or advanced control experiments, and is ideal for student project work.

Essential Services

Electrical supply: 240/110 VAC, 1 A, 50/60 Hz, with earth
Other voltages and frequencies available to special order

Bench space needed: 1 m x 750 mm

Operating Conditions

Operating environment: Laboratory

Storage temperature range: –25°C to +55°C (packed)

Operating temperature range: +5°C to +40°C

Operating relative humidity range: 80% at temperatures < 31°C decreasing linearly to 50% at 40°C

Specifications

Nett dimensions and weight:
540 mm x 330 mm x 420 mm, 18.7 kg

Packed dimensions and weight:
0.3 m^3, 41 kg (approx – packed for export)

Inputs: 0 to 10 VDC
- Motor control signal: 0 to +/– 10 VDC
- Generator load control
- Signal conditioning blocks – deadzone, anti-deadzone and saturation: 0 to +/– 10 VDC
- Hysteresis block: 0 to +/– 10 VDC

Outputs: 0 to 10 VDC
- Reference Set Point - 0 to +/– 10 VDC
- Servomotor shaft speed
- Gearbox position (angle)
- Signal conditioning blocks – deadzone, anti-deadzone and saturation: 0 to +/– 10 VDC
- Hysteresis block

Other connections: 0 to 10 VDC
User-adjustable position (angle) setpoint

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