COUPLED DRIVES APPARATUS

CE108

Compact, benchtop apparatus designed to allow students at all academic levels to investigate basic and advanced principles of control, including control of multi-variable systems.

KEY FEATURES

- Self-contained and compact benchtop unit that demonstrates basic speed control and advanced multivariable control
- Coupled drives demonstrate the problems of speed and tension control
- Mimics many industrial and household applications 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 see what they are controlling

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TECQUIPMENT

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DESCRIPTION

The CE108 Coupled Drives apparatus shows the problems of controlling speed and tension in coupled drives. Many applications use coupled drives, for example: magnetic tape drives, textile machines and paper mills.

The apparatus has two electric motors, coupled by a continuous flexible belt. The belt also passes over a swinging arm with a 'jockey wheel' that measures the belt speed and tension. A manual control allows the user to adjust the spring tension at the swinging arm.

The basic control problem is to vary the torque in the motors to regulate the belt speed and tension. The user guide also shows techniques for speed and tension control, simultaneous control of velocity and tension, and analysis of multivariable control systems.

STANDARD FEATURES

- Supplied with comprehensive user guide
- Five-year warranty
- Made in accordance with the latest European Union directives
- ISO9001 certified manufacturer

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 CE108.

RECOMMENDED ANCILLARIES

- Optical Tachometer (OT1)

LEARNING OUTCOMES

- Independent control of speed and tension
- Simultaneous control of speed and tension
- Practical methods of controlling multi-variable electro-mechanical systems

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:

220 VAC to 240 VAC at 0.4 A or
110 VAC to 120 VAC at 2 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

SOUND LEVELS

Less than 70 dB(A)

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SPECIFICATIONS

TecQuipment is committed to a programme of continuous improvement; hence we reserve the right to alter the design and product specifcation without prior notice.

NETT DIMENSIONS AND WEIGHT:

540 mm x 330 mm x 625 mm, 20 kg

PACKED DIMENSIONS AND WEIGHT:

0.37 m^3, 30 kg (approx – packed for export)

INPUTS: 0 TO 10 VDC

- Motors 1 and 2: 0 to +/– 10 VDC

OUTPUTS: 0 TO 10 VDC

- Motors 1 and 2: speed
- Belt tension: 0 to +/– 10 VDC
- Jockey pulley speed: 0 to +/– 10 VDC

OTHER CONTROLS:

Swinging arm spring tension

OTHER PARTS INCLUDED:

Connecting cables and spare belts