



CE120

## CONTROLLER

Electronic process controller with built-in computer interface and fully adjustable analogue control blocks. Connects to other products in TecQuipment's Control Engineering (CE) range.



- Compact, bench-mounting unit that includes all the important parts of a process controller
- Easy to connect, low-voltage inputs and outputs are buffered for educational use
- Full range of control blocks including proportional, integral and a complete PID
- Includes an interface for computer control (with data acquisition) of TecQuipment's Control Engineering range
- Front panel has clear diagrams that mimic parts of the controller, so students can see and understand what they connect
- Supplied with TecQuipment's Control Software (CE2000) for control and data acquisition
- Includes digital meter to measure voltages and show the frequencies from the on-board function generator

## DESCRIPTION

The CE120 Controller is for use with most products in TecQuipment's Control Engineering range, but it will work with any other compatible laboratory equipment.

This compact unit has analogue electronic circuits connected in blocks. These blocks mimic the important parts of industrial controllers. Clear diagrams on the front panel of the controller show the blocks, each of which has its own set of connection sockets. The user connects the blocks in any way that they need and then connects them to their chosen products in the CE range.

The blocks include:

- Proportional and integral blocks
- A complete three-term PID (proportional, integral, derivative) block
- Fully adjustable potentiometers that can work as set-points or attenuators
- A function generator and digital voltmeter
- Summing junctions
- Phase lead

The controller also includes an interface with D/A (digital to analogue) and A/D (analogue to digital) connections. This allows the user to connect their product from the CE range to a suitable computer (not supplied) for computer control and data acquisition. The controller includes a copy of TecQuipment's CE2000 Control Software (see separate datasheet for details).

The Controller is a more advanced alternative to the CE122 Interface, as it has the additional analogue control features.

## AVAILABLE EXPERIMENT MODULES

Selected products in TecQuipment's Control Engineering range:

- Thermal Process Control (CE103)
- Coupled Tanks (CE105 and CE105MV)
- Ball and Beam (CE106)
- Engine Speed Control (CE107)
- Coupled Drives (CE108)
- Ball and Hoop (CE109)
- Servo Trainer (CE110)

## STANDARD FEATURES

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

## LEARNING OUTCOMES

When used with other products in the CE range:

- Temperature (thermal) control
- Level control
- Engine speed control
- Servo control
- Coupled drive control
- Ball and beam control
- Ball and hoop control

## RECOMMENDED ANCILLARIES

- Suitable computer with two spare USB connections (not supplied by TecQuipment) – see the CE2000 datasheet for full details.

## ESSENTIAL SERVICES

### ELECTRICAL SUPPLY:

90 VAC to 250 VAC, 0.5 A, 50/60 Hz, with earth

### BENCH SPACE NEEDED:

800 mm x 600 mm

## OPERATING CONDITIONS

### OPERATING ENVIRONMENT:

Laboratory

### STORAGE TEMPERATURE RANGE:

-25°C to +55°C (when packed for transport)

### 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)

# CONTROLLER

## SPECIFICATIONS

### NETT DIMENSIONS AND WEIGHT:

540 x 330 x 140 mm, 5 kg

### PACKED DIMENSIONS AND WEIGHT:

0.06 m<sup>3</sup>, 10 kg (approx – packed for export)

### SUMMING JUNCTIONS:

Four, each with three '+ve' inputs and one '-ve' input

### INTEGRATORS:

Three, each with variable gain

### PROPORTIONAL AMPLIFIERS:

Four, each with variable gain

### PID BLOCK:

Parallel connected proportional, integral and derivative block – each part has variable gain

### POTENTIOMETERS AND POWER SUPPLY:

- Four potentiometers for general-purpose applications, such as adjusting the 'set points' or attenuating a signal
- +10 VDC, 0 V and -10 VDC power supply

### DISPLAY AND FUNCTION GENERATOR:

Digital display of voltage measured (+/- 15 V) or frequency of function generator. Function generator gives square, sinusoidal or sawtooth signals at variable frequency. Signals can be offset and amplitude adjusted.

Frequency range 0.01 to 100 Hz

### PHASE LEAD BLOCK:

One, with three settings

### INTERFACE:

- Eight A-D inputs:  $\pm 10$  V
- Four D-A outputs:  $\pm 10$  V,
- USB connection to suitable computer

### OTHER PARTS INCLUDED:

Connecting cables