

Bio-reactor Unit for Cell culture fermentation



OBJECTIVES

- To manufacture a bio-reactor vessel and all associated heaters, agitation, controls, and mass flow meter.
- The pressure vessel being of a transparent material to facilitate visual inspection of the process.
- To conform to relevant pressure vessel standards.
- Include safety measures such as lock-out doors over a given temperature

INTRODUCTION

Control and Thermal Engineering were asked to design and manufacture a bio-reactor for a Western Australian university. Bio-reactors are used for the fermentation of live cell cultures.

Working with the client, CTE were able to expand on the best methods of construction and possible safety issues the design should address.

The unit involved a pressurised vessel of clear borosilicate glass enclosing an agitator and heater within. CTE designed and built a glycol cooled mechanical agitator seal. The top of the vessel also included a number of sample and entry points for the addition of gases and liquids. All this was enclosed into a stainless steel enclosure with polycarbonate viewing windows.

The unit was computer programmable, allowing the operator to vary the temperature, agitation, and duration of operations. A mass flow meter ensured precise addition of operating gases and fluids required for given processes.

Upon completion of the project the client was, "*pleased beyond words*", at the "*attention to detail that goes beyond standard manufacturing*".

"A really creative piece of work, I'm most impressed."

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