

## Task 1 - Design

You must:

- a) produce a detailed design specification that builds on the design criteria given in the assignment brief, including any references to research used. The specification should include:
  - a definition of the operating limits of the system
  - an analysis of how system stability will be achieved
- b) generate a suitable design for the control system, including:
  - annotated sketches, block and wiring diagrams for the system that show how it will function
  - selection of appropriate sensors with justifications, and all relevant calculations
  - selection of appropriate pre alarm temperatures with justifications and all relevant calculations. (The exact position of the pre alarm range limits will be determined by the design of your system)
- c) produce a virtual model of the proposed design using appropriate software
- d) create a bill of materials (BoM) listing all of the parts required in your final design proposal.

### Conditions of assessment:

- the time allocated for this task is **14 hours**
- you must carry out the task on your own, under **controlled conditions**.

### Controlled conditions:

- you must only work on the tasks in the allocated times
- assessment evidence must be handed in at the end of each session for secure storage which cannot be accessed
- you must not share or discuss your work with other candidates
- you are not permitted to bring any materials into the assessment session.

### What must be produced for marking:

- design specification
- annotated sketches, block and wiring diagrams
- design options for the sensors with justifications, and calculations
- selection of appropriate pre alarm temperatures with justifications and calculations, including all workings
- outcomes of the virtual modelling of the proposed system design, either as screen captures or printouts
- bill of materials
- any notes produced of research undertaken including citation of sources and internet search history.

**Resources:**

- access to the internet
- access to appropriate virtual modelling and CAD software
- manufacturer's datasheets
- scientific calculator.

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