

T Level Technical Qualification in Engineering, Manufacturing, Process and Control

**Employer-Set Project
(8730-034)**

**Task 3
Summer 2024**

Task 3 – Design

You are to develop your design solution in response to the project brief.

With reference to the project brief, and your response to previous tasks, you must produce a detailed design of a valve adaptor.

Your design must consider:

- the overall length when two adaptors are screwed into the pneumatic valve and the difference in length between the pneumatic valve assembly and the previous manual valve assembly
- the width of material provided to engage the tool to support the valve assembly whilst being tightened
- the method of ensuring that the connections between the adaptor and any pipe or valve fitting are watertight
- the amount that adjacent pipework will need to be shortened to allow for the extension in length of the pneumatic valve and adaptor assembly
- the size of the hole through the center of the adaptor to allow for unimpeded flow of liquids through the adaptor.

Part A

You must create a dimensioned drawing for a valve adaptor that addresses the brief detailing:

- thread size details (Major, Minor and Effective diameters for a 2 " 7 TPI BSW thread and 1" BSP thread)
- overall length and length of thread dimensions
- details of any seal grooves or sealing faces incorporated into the design
- width of any features used for engagement of a tool
- size of hole through the center of the adaptor.

As part of your design, you must also produce a drawing detailing:

- a representation of the pipe flanged end and section of pipe
- the amount the pipework will need to be shortened by to allow for the difference between the manual valve and the pneumatic valves when fitted with two adaptors.

Drawings can either be produced using a CAD package or by hand as a paper-based drawing. Drawings must be produced in 3rd Angle Projection and in accordance with the drawing standard BS 8888.

You can include draft iterations of your design to show how your design idea has developed.

The submission for this task will typically be two A3 drawings (one for the valve adaptor and one showing the pipework shortening).

Part B

As part of your design, you must include any relevant design calculations related to your assembly drawing.

This must include:

- identifying the increase in the length of the valve and adaptor assembly compared to the manual valve
- the cost of materials.

Alongside your calculations, you must include reflective notes on how well the design meets the requirements of the brief. This must include:

- rationale for your final design option
- whether your design fit for purpose
- does it meet the clients requirements.

The submission for this task will typically be two A4 sides of supporting calculations and reflective notes.

Timing of assessment

- You will have **six hours** to complete your design and calculations.

Conditions of assessment

- Your design must be completed working alone under supervised conditions.
- You must not share or discuss your work with other candidates.
- You will have access to copies of your responses to the previous tasks (for review purposes only).
- You will have access to relevant CAD software for the completion of drawings.
- You will **not** have access to the Internet for the completion of this task.
- Assessment evidence must be handed in at the end of each session for secure storage which cannot be accessed.

What you must submit on completion of this task

- **Part A: Dimensioned adaptor drawing** (A3 size) – this may include design iterations if you wish to include them and a drawing showing **pipework modifications**. (A3 size).
- **Part B: Supporting design calculations and reflection notes** (typically two sides of A4) – hard copy or file saved securely (e.g. in a secure online location or on memory stick to be handed in).

Additional evidence of your performance that will be captured for marking

- N/A

Marks available

- 24

Get in touch

City & Guilds Technicals Quality Team

We are here to answer any queries you may have regarding your T Level Technical Qualification delivery.

Should you require assistance, please contact us using the details below:

T: 0300 303 53 52 (Monday – Friday 08:30 – 17:00 GMT)

E: technicals.quality@cityandguilds.com

W: cityandguilds.com/tlevels

The T Level is a qualification approved and managed by the Institute for Apprenticeships and Technical Education.

Copyright in this document belongs to, and is used under licence from, the Institute for Apprenticeships and Technical Education, © 2024. 'T-LEVELS' is a registered trademark of the Department for Education. 'T Level' is a registered trademark of the Institute for Apprenticeships and Technical Education. 'Institute for Apprenticeships & Technical Education' and logo are registered trademarks of the Institute for Apprenticeships and Technical Education.

We make every effort to ensure that the information contained in this publication is true and correct at the time of going to press. However, City & Guilds' products and services are subject to continuous development and improvement, and the right is reserved to change products and services from time to time. City & Guilds cannot accept responsibility for any loss or damage arising from the use of information in this publication.

City & Guilds Limited. All rights reserved. City & Guilds is a trademark of City & Guilds Limited, a company registered in England and Wales (company number 16513878). City and Guilds Group Giltspur House, 5–6 Giltspur Street London EC1A 9DE.