

<b>Title</b>	<b>Design a complex pneumatic power control system</b>		
<b>Level</b>	<b>5</b>	<b>Credits</b>	<b>10</b>

<b>Purpose</b>	People credited with this unit standard are able to prepare to design, and undertake design of a complex pneumatic power control system.
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<b>Classification</b>	Mechanical Engineering > Fluid Power - Pneumatics
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<b>Available grade</b>	Achieved
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### Explanatory notes

- 1 Reference  
Health and Safety in Employment Act 1992.
- 2 Definitions  

*Complex pneumatic power control system* – a fully automated cyclic machine operating with a range of opposing commands such as ABBACC, a typical example of which is a set of linear thrusters for conveying and positioning (pick and place). Control systems may include but are not limited to – Cascade and set-counter circuit design method, but does not include mechanical logic (stepper units).

*Industry practice* – safe and sound practices accepted by the mechanical engineering industry.

*Worksite procedures* – operational procedures put in place by the candidate's employer. These include site safety procedures, equipment operating procedures, job procedures, quality assurance processes and procedures, and other procedures for the handling and disposal of materials and waste.
- 3 The following apply to this unit standard:
  - a All activities must demonstrate safe working practices.
  - b All activities must be completed independently and reported within reasonable timeframes.
  - c The design and specification of the pneumatic fluid power system is the outcome of this unit standard. The actual construction of the system is not a requirement of assessment.
  - d Appropriate symbol(s) must also be used in the design to indicate the source of air supply.
- 4 Range  
Components selected for the system will be from the air distribution system only, and must include the following:
  - At least three actuators (double-acting cylinders).
  - At least two five-port valves (pilot operated).
  - Roller valves and one-way trip valves.

- Piping and tubing.
- Air-conditioning equipment, examples of which include refrigerated air dryer, line filter, and drains (manual, auto float, or electrical).

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## Outcomes and evidence requirements

### Outcome 1

Prepare to design a complex pneumatic power control system.

#### Evidence requirements

- 1.1 Design specification and operational requirements are understood and confirmed with customer in accordance with worksite procedures.
- 1.2 Control circuit working principles are explained.  
  
Range may include but is not limited to – division of operating commands into groups, step inputs and step outputs, logic switching equations.
- 1.3 Design safety and regulatory requirements are identified and confirmed with customer in accordance with worksite procedures.
- 1.4 Personnel associated with end use and complementary services are identified and consulted in accordance with worksite procedures.

### Outcome 2

Undertake design of a complex pneumatic power control system.

#### Evidence requirements

- 2.1 Calculations are made to determine sizing of components to meet design specification.
- 2.2 Terminology and symbols are selected to match specification in accordance with industry practice.
- 2.3 Design meets specification and operational capabilities.  
  
Range component size, selection, and placement.
- 2.4 Design meets specifications and operational requirements of complementary systems requirements in accordance with worksite procedures.
- 2.5 Design and operational capabilities meets safety and regulatory requirements in accordance with worksite procedures.
- 2.6 Documentation meets specifications and operational requirements in accordance with worksite procedures.

Range may include but is not limited to – bill of materials, maintenance manual and service schedules, step displacement diagram (traverse time diagram), block diagram, circuit diagram, as built drawings, training manuals, labelling and safety information.

<b>Planned review date</b>	31 December 2016
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#### Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	25 May 2004	31 December 2014
Review	2	17 November 2011	N/A

<b>Consent and Moderation Requirements (CMR) reference</b>	0013
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

#### Please note

Providers must be granted consent to assess against standards (accredited) by NZQA, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be granted consent to assess against standards by NZQA before they can register credits from assessment against unit standards.

Providers and Industry Training Organisations, which have been granted consent and which are assessing against unit standards must engage with the moderation system that applies to those standards.

Requirements for consent to assess and an outline of the moderation system that applies to this standard are outlined in the Consent and Moderation Requirements (CMR). The CMR also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

#### Comments on this unit standard

Please contact Competenz on [qualifications@competenz.org.nz](mailto:qualifications@competenz.org.nz) if you wish to suggest changes to the content of this unit standard.