



Australian Government

MEM30011 Set up basic pneumatic circuits

Release: 1

MEM30011 Set up basic pneumatic circuits

Modification History

Release 1. Supersedes and is equivalent to MEM30011A Set up basic pneumatic circuits.

Application

This unit of competency defines the skills and knowledge required to set up and select components associated with single linear pneumatic systems.

This unit applies to all manufacturing and engineering workplace environments. It refers to simple pneumatic circuits containing single linear actuators and motors and is limited to linear actuators, motors, control valves and to the selection and verification of components for the simple pneumatic circuits.

The unit applies to engineering or related activities and is suitable for people giving technical support in manufacturing or engineering operations and those pursuing technical qualifications and careers at paraprofessional or technician level. All work is carried out under supervision.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

Nil

Competency Field

Engineering technician

Elements and Performance Criteria

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Determine system requirements	1.1 Follow standard operating procedures (SOPs) and comply with work health and safety (WHS) requirements at all times 1.2 Obtain instructions regarding system requirements and clarify as necessary 1.3 Correctly interpret circuit drawings using standard symbols
2. Select components for simple pneumatic	2.1 Select suitable air system components for fluid power systems from specification charts

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
circuits	2.2 Select linear actuators to suit system requirements 2.3 Selected control valves to suit system requirements 2.4 Select tubing or hose and fittings to suit system requirements
3. Verify component selection	3.1 Set up trial basic pneumatic circuits on test bench 3.2 Store approved sketches, drawings, specifications and catalogues 3.3 Issue approved sketches, drawings or specifications 3.4 Analyse operation and verify outcomes against system requirements

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Safety procedures include:	• following required precautions when: • using compressed air • shutting down air compressors and receivers • exhausting stored energy.
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Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM30011A Set up basic pneumatic circuits.

Links

Companion Volume Implementation Guides are available on VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>

Assessment Requirements for MEM30011 Set up basic pneumatic circuits

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include:

- determining system requirements
- selecting pneumatic circuit components
- setting up basic pneumatic circuits on at least two occasions
- verifying component selection.

Note: Where a volume and/or frequency is not specified, demonstration must be provided at least once.

Knowledge Evidence

Evidence required to demonstrate the required knowledge for this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include knowledge of:

- fluid power principles including:
 - definition of the term fluid power
 - differences between pneumatic and hydraulic systems
 - advantages and disadvantages of fluid power when compared to mechanical and electric power systems
 - basic properties and units including mass, volume, density, specific volume, relative density, force and weight, pressure (absolute, atmospheric and gauge), temperature (Celsius and Kelvin), viscosity and surface tension
 - introduction to temperature and pressure effects on the basic properties and applications
 - safety procedures when working with compressed air and associated equipment
- pneumatic system components including:
 - air compressors
 - receivers, interlocks
 - pipes both rigid and flexible
 - valves including types and functions
 - filters including types and functions
 - gauges and instruments including pressure and temperature gauges, liquid level gauges, thermometers, thermocouples, manometers and piezometers

- pipe fittings including elbows/bends
- flow measurement instruments including venturi and orifice meters
- air motors
- linear actuators including:
 - types, selection and functions
 - methods of supporting linear actuators
 - introduction to calculations related to linear actuators
 - recognition and drawing of standard symbols
 - observation and analysis of performance of linear actuators in laboratory circuits
- pneumatic control valves including:
 - directional controls and functions
 - check valves and functions
 - pressure controls and functions
 - flow controls and functions
 - drawing and analysis of typical circuits containing control valves
 - observation and analysis of performance of valves in basic circuits
- circuit design and analysis (single linear actuator) including:
 - recognition and drawing of standard symbols for pneumatic components
 - drawing and analysis of circuit diagrams containing basic components
- setting up and operating circuits on pneumatic benches in a fluid power laboratory.
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Assessment Conditions

- Assessors must:
 - have vocational competency in setting up basic pneumatic circuits at least to the level being assessed with relevant industry knowledge and experience
 - satisfy the assessor requirements in the Standards for Registered Training Organisations 2015 or its replacement and comply with the National Vocational Education and Training Regulator Act 2011, its replacement or equivalent legislation covering VET regulation in a non-referring state/territory as the case requires.
- Where possible, assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions that cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required including relevant workplace procedures, product and manufacturing specifications.
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.
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