



**Australian Government**

# **UEENEEI128A Set up and configure controls on complex fluid systems**

**Release: 3**

## UEENEEI128A Set up and configure controls on complex fluid systems

### Modification History

Release	Action	Core/Elective	Details	Points
2	Edit	N/A	Show full pre-req chain in the unit	
2	Edit	N/A	Inserted topic numbering in Required Skills and Knowledge	
2	Edit	N/A	Replaced "essential knowledge and associated skills" with "required skills and knowledge"	
3	Edit	N/A	In Pre-requisites, edit name to reflect correct unit title UEENEEI124A Fault find and repair analogue circuits and components in electronic control systems	

### Unit Descriptor

#### Unit Descriptor

#### 1) Scope:

##### 1.1) Descriptor

This unit covers the setting up, adjustment, maintenance and modification of electronically controlled complex systems that are integrated with hydraulic devices. It encompasses working safely, applying extensive knowledge of complex circuits designed to operate fluid systems and the integration to hydraulics, gathering and analysing data, applying problem solving techniques, developing and documenting solutions and alternatives.

#### Note:

Typical problems are those encountered in meeting performance requirements and compliance standards, revising a machine operating parameters and dealing with machine malfunctions.

## Application of the Unit

### Application of the Unit 2)

This unit applies to any recognised development program that leads to the acquisition of a formal award at AQF level 6

## Licensing/Regulatory Information

### License to practice 3)

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety, codes of work practice and standard work procedures related to the operation of automated machinery.

## Pre-Requisites

### Prerequisite Unit(s) 4)

### Competencies 4.1)

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must have been completed plus all the competencies in one (1) of the identified Pathway Unit Group(s):

Electrical

Instrumentation and Control

Common Unit Group

UEENEEE1 Apply Occupational Health and Safety regulations, codes and practices in the workplace  
01A

UEENEEE1 Fabricate, assemble and dismantle utilities

<b>Prerequisite Unit(s)</b>	<b>4)</b>
	02A industry components
	UEENEEE1 Solve problems in d.c. Circuits 04A
	UEENEEE1 Use drawings, diagrams, schedules, 07A standards, codes and specifications
	UEENEEG1 Solve problems in electromagnetic devices 01A and related circuits
	UEENEEG1 Solve problems in low voltage a.c. circuits 02A
	UEENEEI12 Fault find and repair analogue circuits and 4A components in electronic control systems
	UEENEEI12 Analyse complex electronic circuits 7A controlling fluids
	UEENEEI13 Diagnose and rectify faults in digital 9A controls systems
	<b>Electrical Pathway Group</b>
	UEENEEG0 Solve problems in single and three phase 06A low voltage machines
	UEENEEG0 Solve problems in single and three phase 33A low voltage electrical apparatus and circuits
	UEENEEG0 Arrange circuits, control and protection for 63A general electrical installations
	UEENEEG1 Terminate cables, cords and accessories for 06A low voltage circuits
	UEENEEG1 Trouble-shoot and repair faults in low 08A voltage electrical apparatus and circuits
	<b>Instrumentation and Control Pathway Group</b>
	UEENEEE1 Solve problems in multiple path extra low 19A voltage (ELV) a.c. circuits
	UEENEEI10 Use instrumentation drawings, 1A specification, standards and equipment

<b>Prerequisite Unit(s)</b>	<b>4)</b>	
		manuals
	UEENEEI10 2A	Solve problems in pressure measurement components and systems
	UEENEEI10 3A	Solve problems in density/level measurement components and systems
	UEENEEI10 4A	Solve problems in flow measurement components and systems
	UEENEEI10 5A	Solve problems in temperature measurement components and systems
	UEENEEI10 6A	Set up and adjust PID control loops
	UEENEEI11 0A	Set up and adjust advanced PID process control loops
	UEENEEI11 2A	Verify compliance and functionality of instrumentation and control installations
	UEENEEI11 3A	Setup and configure Human-Machine Interface (HMI) and industrial networks

**Literacy and numeracy skills 4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 3      Writing 3      Numeracy 3

## Employability Skills Information

**Employability Skills 5)**

This unit contains Employability Skills

The required outcomes described in this unit of

**Employability Skills**

5)

competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

**Elements and Performance Criteria Pre-Content**

6) Elements describe the essential outcomes of a competency standard unit  
 Performance Criteria describe the required performance needed to demonstrate achievement of the element.  
 Assessment of performance is to be consistent with the Evidence Guide.

**Elements and Performance Criteria****ELEMENT****PERFORMANCE CRITERIA**

1 Prepare to set up controls on complex fluid systems.	1.1	OHS processes and procedures for a given work area are identified, obtained and understood
	1.2	Established OHS risk control measures and procedures are followed in preparation for the work.
	1.3	The extent of the work to be undertaken is determined from performance specifications and situation reports and in consultations with relevant persons
	1.4	Activities are planned to meet scheduled timelines in consultation with others involved in the work.
	1.5	Effective strategies are determined to ensure solutions developed and related implementation is carried out efficiently.
2 Set up controls on complex fluid systems	2.1	OHS risk control measures and procedures for carrying out the work are followed.
	2.2	Knowledge of complex controls and integrated fluid systems are applied to developing analytical solutions to machine parameters and

ELEMENT	PERFORMANCE CRITERIA
	operation.
	2.3 Parameters, specifications and performance requirements in relation to each control circuit and fluid device are obtained in accordance with established procedures.
	2.4 Approaches to setting up, maintenance and/or modification are carried out to provide the most effective solution(s).
	2.5 Unplanned events are dealt with safely and effectively consistent with regulatory requirements and enterprise policy.
	2.6 Quality of work is monitored against personal performance agreement and/or established organisational or professional standards
3 Document and report on the results of the set up and actions taken.	3.1 Solutions to set up, maintenance activity and/or modification are tested to determine their effectiveness and modified where necessary.
	3.2 Set-up, maintenance activity and/or modification is documented including details of all findings, calculations and assumptions.
	3.3 Set-up, maintenance activity and/or modification is reported to appropriate personnel to establish suitable action to be taken based on findings.
	3.4 Justification for findings and any actions to be undertaken in relation to the work activity is documented for inclusion in work/project or development records in accordance with professional standards.

## Required Skills and Knowledge

### REQUIRED SKILLS AND KNOWLEDGE

8) This describes the required skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and setting up controls on complex fluid systems.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

#### **KS01-EI128 Complex fluid control systems**

##### **A**

Evidence shall show an understanding of advanced fluid mechanics to an extent indicated by the following aspects:

- T1 The relationship between Reynolds Number and flow regime
- T2 Head loss in pipes and fittings and system head curves
- T3 Head loss in parallel and serial pipes and how systems can be reduced to an equivalent single pipe system for analytical purposes
- T4 Flow rates through open channels
- T5 Positive displacement and rotodynamics of fluid machinery
- T6 Duty point for a pump in a system including flow rate and head pressure
- T7 Cavitations and the influence of inlet system design and fluid temperature and pressure on cavitations
- T8 Circuits and operation of fluid hydraulic componentry in a system
- T9 Technical specifications and associated data for the selection of hydraulic components for machine control operation
- T10 Installation requirements for the installation, commissioning and testing hydraulic components and systems



## Evidence Guide

### EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

### Overview of Assessment 9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. In some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work influence how/much the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

**Critical aspects of evidence required to demonstrate competency in this unit 9.2)**

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each Element and associated performance criteria must be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the required skills and knowledge as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Set up controls on complex fluid systems as described in 8) and including:
    - A Understanding the operation of electronic and hydraulic controls
    - B Forming effective strategies for analysing circuit and hydraulic performance
    - C Obtaining circuit control and hydraulic

- parameters, specifications and performance requirements appropriate to each situation.
- D Testing the results of the analysis
- E Documenting instruction for implementing any actions resulting from the analysis that incorporates risk control measure to be followed.
- F Documenting justification of actions to be implemented in accordance with professional standards
- G Dealing with unplanned events by drawing on required skills and knowledge to provide appropriate solutions incorporated in a holistic assessment with the above listed items

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

**Context of and specific resources for assessment** 9.3)

This unit must be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, the conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry

practices in relation to setting up controls on complex fluid systems.

**Method of assessment**

**9.4)**

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is intended primarily for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the required skills and knowledge described in this unit.

**Concurrent assessment and relationship with other units**

**9.5)**

There are no concurrent assessment recommendations for this unit.

## Range Statement

### RANGE STATEMENT

**10)** This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit must be demonstrated in relation to setting up electronically controlled fluid operated complex systems on at least 2 types of machines.

Note.

Typical circuits are those encountered in meeting performance requirements and compliance standards, revising a machine operating parameters and dealing with machine malfunctions

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

## Unit Sector(s)

Not applicable.

## Competency Field

**Competency Field**            **11)**