



The New Zealand Apprenticeship in Dairy Systems (Engineering)

Programme handbook for employers and learners

Competenz
SKILLS FOR INDUSTRY



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The New Zealand Apprenticeship in Dairy Systems (Engineering) – Level 4

Building skills, careers and businesses

If you're reading this booklet, it's likely you're about to make a big decision. You may be a company investing in your people and your business by building skills in the workplace, or a learner embarking on a career in dairy systems.

In both cases, the New Zealand Apprenticeship in Dairy Systems (Engineering) will help make your decision a wise one. That's because members of your industry have designed these qualifications. They understand the skills employers and employees need to work productively and safely. They also understand that, as a learner, you're looking to gain skills that will help you build a rewarding career. The resulting qualifications are flexible, practical, and designed with the future in mind.

Read on to understand the skills and knowledge these qualifications deliver, the training options available to study towards them, and how Competenz will help you build skills, careers and businesses in dairy systems.



Peter Ferguson
Industry Manager
Competenz



Maria Scott
Executive Officer
NZ Milking & Pumping Trade Assn

About the qualifications and how to work towards them

The purpose of the dairy systems qualification

This qualification provides the dairy industry with people who have the multi-disciplinary skills and knowledge needed to work independently to install and maintain milk harvesting, farm water or effluent systems.

New Zealand Certificates: nationally recognised qualifications

These qualifications are New Zealand Certificates. New Zealand Certificates recognise skills and knowledge that meet nationally agreed standards for achievement. Employers recognise these qualifications because:

- Members of your industry have designed and endorsed them;
- The New Zealand Qualifications Authority (NZQA) has approved them and records learners' study towards them.

How the dairy systems qualification works

The qualification is made up of core competencies and two strands – milking systems and pumping systems, which employers and their learners can choose between.

The qualification is level 4, and is a recognised apprenticeship. Once the training is complete a graduate will be able to work independently and only require broad supervision.

Apprentices working towards this qualification through a Competenz training programme will complete unit standards.

The training programme contains compulsory unit standards that all learners must complete and has a series of optional unit standards in the final year of study that the learner and employer need to select to complete the balance of the programme.

The unit standards build an apprentice's skill set by progressing them from level 2 through to level 4 (trade standard).

When a learner completes a unit standard successfully, they receive credits which Competenz registers on their record of achievement with NZQA. To complete the qualification a learner needs to be assessed on all the unit standards in their training programme.

The qualification takes 36 – 42 months to complete.

Unit Standards

Unit standards are defined skills at a given level (e.g. Level 4) which indicates the degree of knowledge and skill and how it is applied; each also has a credit value that reflects how much effort goes into achieving that unit.

Credits

Each credit represents approximately ten hours of learning.



Qualification pathway for Dairy Systems

Level 4

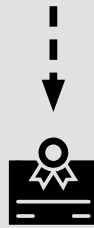


NZ Apprenticeship
in Dairy Systems
with strands in:

- Milking
- Pumping

No entry requirement

Level 5



NZ Certificate
in Mechanical
Engineering
(Advanced)

Entry requirement - Level 4 or
equivalent skills or knowledge

Level 6



NZ Diploma
in Engineering

Entry requirement – NCEA
Level 2 with mathematics



NZ Diploma
in Engineering Practice

Entry requirement – NZ Diploma
in Engineering



About the level 4 apprenticeship qualification and how learners work towards it

On-the-job learning and assessment

Apprentices do most of their learning in the workplace. They receive workbooks to support some of the theory they learn. Apprentices also receive assessment guides that explain how their on-job learning will be assessed. Learners' skills are checked in the workplace by verifiers who have the appropriate technical knowledge and skills.

Competenz account managers or registered workplace assessors then assess the evidence collected to determine whether the learner has met the required standard.

Off-job learning and assessment

Off-job learning takes place outside the workplace. It takes multiple forms:

- **eLearning.** Learners use a computer with internet connection to log into an online portal. Here they receive learning materials to study and complete online tasks. In most cases assessment takes place online.
- **Block course.** This takes place at a polytechnic or training center over a two week period. Apprentices learn how to perform tasks relevant to their qualification under a tutor's instruction. The tutor also assesses their skills.
- **Public courses.** These courses cover first aid, and the certificates that lead to an Electrical Workers Registration Board Practising Certificate, the Trainee Limited Certificate, the Electrical Appliance Serviceperson and the Electrical Service Technician.
- **Training Scheme.** These are specific courses that need to be completed as part of the Milking Systems strand.

Funding the apprenticeship training

Competenz receives government funding to keep the fees for apprenticeships manageable.



How Competenz helps learners gain their skills

When apprentices enrol, we assign them a Competenz account manager. Our account managers understand the engineering industry and the challenges learners and businesses face. They play a vital role in helping apprentices learn and complete their qualifications in the allocated time.

The training process

1. Signing a training agreement

The apprentice, company and account manager sign a training agreement. This agreement outlines what each person or organisation is responsible for during the training. It also makes government funding available to the company to subsidise their apprentice's training and ensures the NZQA records the learner's training history.

2. Enrolling apprentices in a training programme

The apprentice, their company and account manager agree a training plan that sets out the unit standards the learner needs to complete, and the order and year in which they will do this. These unit standards specify what learners need to know and be able to do (e.g. select, use and care for engineering hand tools).

3. Supporting apprentices as they work towards their qualification

Learners receive workbooks and assessment guides to support their learning. Competenz account managers visit companies to support this learning and review progress. They also arrange the off-job training needed (e.g. block courses).

4. Assessing apprentices' skills

An assessment guide explains the 'evidence' the apprentice needs to gather to show the work they have performed towards gaining the unit standard. This evidence may include things like photographs, job sheets and drawings.

When learners are ready to be assessed in a unit standard, their Competenz account manager or a qualified assessor in their workplace completes an assessment and confirms they have met requirements. If the learner is assessed as 'competent', they receive credits and the unit standard appears on their NZQA record of achievement.

Related qualifications to help learners build their skills

Competenz offers qualifications in related areas like management, sales, and health and safety. Please ask your account manager for more information or contact our customer services team.

More information

If your company has a Competenz account manager, please contact them. Alternatively, please call our customer services team on 0800 526 1800 or visit our website: www.competenz.org.nz



Competenz training programme

for Pumping Systems

New Zealand Apprenticeship in Dairy Systems (Engineering) (Level 4) – Pumping Systems

Credits: 210 credits

Duration: 36-42 months

How apprentices build their skills

Most learning takes place on-the-job. Competenz eLearning, block courses and public courses supplement this learning off-job. The following table explains the mix of learning activities, by year.

Compulsory units to be completed

Expected first year

Year 1 - Competenz eLearning

Graduates will be able to...	Unit standard	Level	Credits
Draw and interpret engineering sketches under supervision	2430	2	4
Construct engineering plane geometric shapes under supervision	2432	2	3
Demonstrate basic knowledge of engineering metals	20799	3	4
Demonstrate basic knowledge of engineering materials	20917	2	2
Demonstrate knowledge of trade calculations and units for mechanical engineering trades	21905	2	6
Demonstrate knowledge of basic mechanics for mechanical engineering trades	21908	2	3

Year 1 - Workplace / On-job

Graduates will be able to...	Unit standard	Level	Credits
Provide customer service	57	2	2
Protect health and safety in the workplace	497	1	3
Assemble mechanical components under supervision	2387	2	2
Select, use and care for, engineering hand tools	2395	2	4
Select, use and maintain portable hand held engineering power tools	2396	2	4
Select, use, and care for simple measuring devices used in engineering	4433	1	2
Select, use, and care for, engineering dimensional measuring equipment	4435	2	3
Demonstrate knowledge of fasteners used in mechanical engineering	21909	2	1
Demonstrate knowledge of safety on engineering worksites	21911	2	1
Apply safe working practices on an engineering worksite	21912	2	2

Year 1 - Public Course (Learner / Employer to organise)

Graduates will be able to...	Unit standard	Level	Credits
Demonstrate knowledge of electrical safety and safe working practices	15851	2	3
Isolate and test electrical sub-circuits	15852	2	2
Provide first-aid	6401	2	1
Provide resuscitation	6402	2	1

Year 1 - Block Course (10 days)

Select, use and care for engineering marking-out equipment	4436	2	4
Perform basic fabrication operations under supervision	25075	2	12
Demonstrate and apply knowledge of safe welding procedures under supervision	21907	2	3
Shift loads in engineering installation, maintenance, and fabrication of work	21913	2	2

Expected second year

Year 2 - Competenz eLearning

Graduates will be able to...	Unit standard	Level	Credits
Demonstrate knowledge of the composition of engineering metals	4797	3	5
Demonstrate knowledge of pneumatics and pneumatic power systems	20612	2	5
Demonstrate knowledge of job costing in mechanical engineering	22900	4	2
Demonstrate knowledge of the installation and maintenance of compressed air and vacuum systems	2159	3	4

Year 2 - Public Course (Learner / Employer to organise)

Graduates will be able to...	Unit standard	Level	Credits
Demonstrate knowledge of theory and legislation for registration of electrical appliance servicepersons (EAS)	27351	3	3

Year 2 - Dairy Systems Block Course

Graduates will be able to...	Unit standard	Level	Credits
Small Drinking Water Supplies			
Demonstrate knowledge of, and evaluate, a small drinking-water supply	22873	4	6
Demonstrate knowledge of, and develop, a PHRMP for a small drinking-water supply	22874	4	6
Backflow Prevention			
Prepare to test, and inspect and test, water supply backflow prevention devices	23847	3	4
Describe suitability, installation, and testing of water supply backflow prevention devices, and fault identification	23848	3	4
Selecting the right pump			
Demonstrate knowledge of pumps and pump selection for rural systems	29163	4	6

Year 2 - Workplace / On-job

Graduates will be able to...	Unit standard	Level	Credits
Replace static seals in machines and equipment	2403	3	5
Safely shut down and isolate machines and equipment	2401	3	3

Expected third year

Year 3 – Public Course (Learner / Employer to organise)

Graduates will be able to...	Unit standard	Level	Credits
Demonstrate knowledge of theory and legislation for registration of electrical service technicians (EST)	27349	3	3

Year 3 - Dairy Systems Block Course

Farm Dairy Effluent Hydraulic Design

Demonstrate knowledge of farm dairy effluent hydraulic design methods	29161	4	5
Apply knowledge of hydraulic design methods to design a farm dairy effluent system	29162	4	10

Farm Water Reticulation Design

Demonstrate knowledge of basic hydraulic theory for rural fluid systems	29158	3	2
Demonstrate knowledge of farm water reticulation design methods	29159	4	5
Apply knowledge of design methods to design a farm water reticulation system	29160	4	10

Elective units to be selected

Year 3 – Workplace / On-job

Install farm plant and equipment	29164	4	10
Weld stainless steel tube using the gas tungsten arc welding process	2688	4	12

- Select a minimum of 10 credits from Set A and a minimum of 15 credits from Set B

Graduates will be able to...	Unit standard	Level	Credits
Set A - Install and Commission Select a minimum of 10 credits (on-job and *eLearning)			
Demonstrate knowledge of bearings used in machines and equipment	*19873	3	8
Demonstrate knowledge of mechanical power transmission	*22899	3	3
Demonstrate knowledge of pumps, fans, and valves used in engineering	*22901	3	3
Level machinery and equipment	2409	3	4
Align machinery and equipment	2408	4	8
Commission mechanical engineering machinery or plant	22915	5	15

**Set B - Maintain and Service | Select a minimum of 15 credits
(on-job and *eLearning)**

Demonstrate knowledge of hydraulics and hydraulic power systems	*20611	2	5
Dismantle, inspect, assemble and test components	2406	4	15
Monitor the condition of machinery and equipment	2407	4	10
Select and replace dynamic seals in machines and equipment	2404	3	8
Service machines and equipment	2397	2	4
Service and replace bearings in machines and equipment	19874	4	12
Perform planned maintenance work on mechanical equipment	22905	4	5
Service hydraulic power system components under supervision	2727	3	20
Service hydraulic power system components	2731	4	20
Diagnose hydraulic power system faults	2733	4	20
Shut down for maintenance, and start up, a hydraulic power system	20597	2	4
Clean a hydraulic power system for service	20599	2	4
Maintain a hydraulic power system	20613	3	7
Service pneumatic power system components	2732	4	20
Shut down for maintenance, and start up, a pneumatic power system	20598	2	4
Maintain a pneumatic power system	20614	3	7

Statement of service

Apprentices need to gain a Statement of Service from their employer, confirming that they have completed 6,000 to 8,000 hours of apprenticeship.



Competenz training programme

for Milking Systems

New Zealand Apprenticeship in Dairy Systems (Engineering) (Level 4) – Milking Systems

Credits: 211 credits

Duration: 36-42 months

How apprentices build their skills

Most learning takes place on-the-job. Competenz eLearning, block courses and public courses supplement this learning off-job. The following table explains the mix of learning activities, by year.

Compulsory Units to be completed

Expected first year

Year 1 - Competenz eLearning

Graduates will be able to...	Unit standard	Level	Credits
Draw and interpret engineering sketches under supervision	2430	2	4
Construct engineering plane geometric shapes under supervision	432	2	3
Demonstrate basic knowledge of engineering metals	20799	3	4
Demonstrate basic knowledge of engineering materials	20917	2	2
Demonstrate knowledge of trade calculations and units for mechanical engineering trades	21905	2	6
Demonstrate knowledge of basic mechanics for mechanical engineering trades	21908	2	3

Year 1 - Workplace / On-job

Graduates will be able to...	Unit standard	Level	Credits
Provide customer service	57	2	2
Protect health and safety in the workplace	497	1	3
Assemble mechanical components under supervision	2387	2	2
Select, use and care for, engineering hand tools	2395	2	4
Select, use and maintain portable hand held engineering power tools	2396	2	4
Select, use, and care for simple measuring devices used in engineering	4433	1	2
Select, use, and care for, engineering dimensional measuring equipment	4435	2	3
Demonstrate knowledge of fasteners used in mechanical engineering	21909	2	1
Demonstrate knowledge of safety on engineering worksites	21911	2	2
Apply safe working practices on an engineering worksite	21912	2	2

Year 1 – Public Course (Learner / Employer to organise)

Graduates will be able to...	Unit standard	Level	Credits
Demonstrate knowledge of electrical safety and safe working practices	15851	2	3
Isolate and test electrical sub-circuits	15852	2	2
Provide first aid	6401	2	1
Provide resuscitation	6402	2	1

Year 1 – Block Course (10 days)

Select, use and care for engineering marking-out equipment	4436	2	4
Perform basic fabrication operations under supervision	25075	2	12
Demonstrate and apply knowledge of safe welding procedures under supervision	21907	2	3
Shift loads in engineering installation, maintenance, and fabrication work	21913	2	2

Expected second year

Year 2 - Competenz eLearning

Graduates will be able to...	Unit standard	Level	Credits
Demonstrate knowledge of the composition of engineering metals	4797	3	5
Demonstrate knowledge of pneumatics and pneumatic power systems	20612	2	5
Demonstrate knowledge of job costing in mechanical engineering	22900	4	2
Demonstrate knowledge of the installation and maintenance of compressed air and vacuum services	2159	3	4

Year 2 – Public Course (Learner / Employer to organise)

Graduates will be able to...	Unit standard	Level	Credits
Demonstrate knowledge of theory and legislation for registration of electrical appliance servicepersons (EAS)	27351	3	3

Year 2 – Dairy Systems Block Course

NZ Milking Machine Testing

Graduates will gain...	Unit standard	Level	Credits
Competency Certificate for the NZMPTA Milking Machine Test	Training Scheme	4	38

Year 2 - Workplace / On-job

Graduates will be able to...	Unit standard	Level	Credits
Replace static seals in machines and equipment	2403	3	5
Safely shutdown and isolate machines and equipment	2401	3	3

Expected third year

Year 3 - Block Course

Graduates will be able to...	Unit standard	Level	Credits
Demonstrate and apply knowledge of welding low carbon steel	22906	3	3
Demonstrate and apply knowledge of welding aluminium and stainless steel	22907	3	3

Year 3 - Dairy Systems Block Course

Graduates will be able to...	Unit standard	Level	Credits
Farm Dairy Systems Management	Training Scheme	4	20

Year 3 - Public Course (Learner / Employer to organise)

Graduates will be able to...	Unit standard	Level	Credits
Demonstrate knowledge of theory and legislation for registration of electrical service technicians (EST)	27349	3	3

Elective units to be selected

Year 3 – Workplace / On-job

Install farm plant and equipment	29164	4	10
Weld stainless steel tube using the gas tungsten arc welding process	2688	4	12

- Select a minimum of 10 credits from Set A and a minimum of 15 credits from Set B

Graduates will be able to...	Unit standard	Level	Credits
Set A - Install and Commission Select a minimum of 10 credit (on-job and *eLearning)			
Demonstrate knowledge of bearings used in machines and equipment	*19873	3	8
Demonstrate knowledge of mechanical power transmission	*22899	3	3
Demonstrate knowledge of pumps, fans, and valves used in engineering	*22901	3	3
Level machinery and equipment	2409	3	4
Align machinery and equipment	2408	4	8
Commission mechanical engineering machinery or plant	22915	5	15

Graduates will be able to...	Unit standard	Level	Credits
Set B – Maintain and Service Select a minimum of 10 credits (on-job and *eLearning)			
Demonstrate knowledge of hydraulics and hydraulic power systems	*20611	2	5
Dismantle, inspect, assemble and test components	2406	4	15
Monitor the condition of machinery and equipment	2407	4	10
Select and replace dynamic seals in machines and equipment	2404	3	8
Service machines and equipment	2397	2	4
Service and replace bearings in machines and equipment	19874	4	12
Perform planned maintenance work on mechanical equipment	22905	4	5
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Statement of service

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About Competenz

Competenz is the industry training organisation (ITO) for the refrigeration and air conditioning industry. We work with businesses and learners across New Zealand to grow skills, careers and businesses.



For more information about Competenz training in Dairy (Engineering) please contact us:
www.competenz.org.nz 0800 526 1800

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