



# Level 3 NVO Diploma in **Engineering Maintenance**

# ENGINEERING

## Qualification Specification

### Overview

This qualification is for learners who need recognition of their competence in one or more of a wide variety of engineering maintenance activities and also need a nationally recognised qualification at Level 3.

### Typical Job

The qualification is applicable to a wide variety of engineering maintenance occupations within the sector, dependent on the pathway chosen.

Qualification code:	501/0544/9
Level:	3
Total qualification time:	1670 Hours
Guided learning hours:	321
Credits:	167



## Purpose of the qualification

This qualification is a National Vocational Qualification (NVQ). It involves the skills and knowledge needed for occupations in engineering maintenance including the ability to organise work and identify and prevent problems. NVQs are based on national occupational standards, which the learner must meet to be competent in a particular task. The achievement of NVQs will encourage an employee to value their contribution to the workplace, and it will develop their skills and potential within the engineering maintenance field.

## What could this qualification lead to?

On completion of this qualification it can form part of an Apprenticeship framework at Level 3, and provides a base for other Level 3 qualifications, and progression to a range of Level 4 qualifications and also into employment.

## Entry Requirements

Learners must have the potential to achieve the assessment criteria set out in the units. There are no entry qualifications required by learners to undertake this qualification unless this is a legal requirement of the process or the environment. Assessment is open to any learner who has the potential to achieve the assessment criteria set out in the assessment routes.

## How is the qualification achieved?

The learner must present evidence (portfolio) which clearly shows they have met the assessment criteria and learning outcomes. The learner must achieve the mandatory and optional units relevant to their pathway (occupational role).

## What will be assessed?

All evidence submitted by the learner against the assessment criteria.

## How will it be assessed?

Evidence for this qualification will be assessed in accordance with the SEMTA engineering assessment strategy, which has been created from engagement with stakeholders (employers etc.) in the engineering sector.

The qualification is not graded and only a pass can be achieved – which indicates the learner's occupational competence.

## Structure

This qualification can be obtained by following either one of the following pathways. The learner is required to complete the mandatory assessment routes, and may also be able to choose from a selection of optional assessment routes.

### Pathway EMA: Mechanical

**Mandatory assessment routes: All four assessment routes must be completed**

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QENM2/001	Complying with Statutory Regulations and Organisational Safety Requirements	2	5	35	A/601/5013
QENM2/002	Using and Interpreting Engineering Data and Documentation	2	5	25	Y/601/5102
QENM3/003	Working Efficiently and Effectively in Engineering	3	5	25	K/601/5055
QENM3/004	Handing Over and Confirming Completion of Maintenance or Installation Activities	3	20	35	T/600/5516

**Optional assessment routes: Both of the following assessment routes must be taken:**

QENM3/005	Carrying Out Fault Diagnosis on Mechanical Equipment	3	50	60	T/600/5533
QENM3/006	Maintaining Mechanical Equipment	3	70	119	H/600/5544

**Plus two assessment routes from the following:**

QENM3/007	Restoring Mechanical Components to Usable Condition by Repair	3	47	91	A/600/5551
QENM3/008	Producing Replacement Components for Maintenance Activities	3	47	91	H/600/5558
QENM3/009	Carrying Out Preventative Planned Maintenance on Mechanical Equipment	3	38	74	A/600/5565
QENM3/010	Carrying Out Condition Monitoring of Plant and Equipment	3	39	81	A/600/5582
QENM3/080	Assisting in the Installation of Mechanical Equipment	3	49	161	J/600/5634

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Pathway EMB: Electrical

**Mandatory assessment routes: All four assessment routes must be completed**

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QENM2/001	Complying with Statutory Regulations and Organisational Safety Requirements	2	5	35	A/601/5013
QENM2/002	Using and Interpreting Engineering Data and Documentation	2	5	25	Y/601/5102
QENM3/003	Carrying out Engineering Activities Efficiently and Effectively	3	5	25	K/601/5055
QENM3/004	Handing Over and Confirming Completion of Maintenance or Installation Activities	3	20	35	T/600/5516

**Optional assessment routes: All of the following assessment routes must be taken:**

QENM3/011	Carrying Out Fault Diagnosis on Electrical Equipment and Circuits	3	50	60	H/600/5592
QENM3/012	Maintaining Electrical Equipment	3	70	119	Y/600/5606
QENM3/013	Modifying or Rewiring Electrical Circuits	3	35	63	D/600/5610

**Plus two assessment routes from the following:**

QENM3/014	Testing Electrical Equipment and Circuits	3	50	60	H/600/5656
QENM3/015	Carrying Out Preventative Planned Maintenance on Electrical Equipment	3	38	74	F/600/5664
QENM3/010	Carrying Out Condition Monitoring of Plant and Equipment	3	39	81	A/600/5582
QENM3/081	Assisting in the Installation of Electrical/Electronic Equipment	3	48	161	H/600/5642



Pathway EMC: Electronic

**Mandatory assessment routes: All four assessment routes must be completed**

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QENM2/001	Complying with Statutory Regulations and Organisational Safety Requirements	2	5	35	A/601/5013
QENM2/002	Using and Interpreting Engineering Data and Documentation	2	5	25	Y/601/5102
QENM3/003	Carrying out Engineering Activities Efficiently and Effectively	3	5	25	K/601/5055
QENM3/004	Handing Over and Confirming Completion of Maintenance or Installation Activities	3	20	35	T/600/5516

**Optional assessment routes: All of the following assessment routes must be taken:**

QENM3/016	Carrying Out Fault Diagnosis on Electronic Equipment and Circuits	3	50	60	Y/600/5671
QENM3/017	Testing Electronic Equipment and Circuits	3	50	60	A/600/5677
QENM3/018	Repairing Electronic Equipment	3	62	81	D/600/5946

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## Pathway EMD: Fluid Power

**Mandatory assessment routes: All four assessment routes must be completed**

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QENM2/001	Complying with Statutory Regulations and Organisational Safety Requirements	2	5	35	A/601/5013
QENM2/002	Using and Interpreting Engineering Data and Documentation	2	5	25	Y/601/5102
QENM3/003	Carrying out Engineering Activities Efficiently and Effectively	3	5	25	K/601/5055
QENM3/004	Handing Over and Confirming Completion of Maintenance or Installation Activities	3	20	35	T/600/5516

**Optional assessment routes: Both of the following assessment routes must be taken:**

QENM3/019	Carrying Out Fault Diagnosis on Fluid Power Equipment and Circuits	3	50	60	T/600/5953
QENM3/020	Maintaining Fluid Power Equipment	3	70	119	M/600/5983

**Plus two assessment routes from the following:**

QENM3/021	Carrying Out Preventative Planned Maintenance on Fluid Power Equipment	3	38	74	J/600/5990
QENM3/010	Carrying Out Condition Monitoring of Plant and Equipment	3	39	81	A/600/5582
QENM3/022	Testing Fluid Power Equipment and Systems	3	46	56	D/600/6000
QENM3/082	Assisting in the Installation of	3	48	161	L/600/5649





## Pathway EME: Engineered Systems

**Mandatory assessment routes: All four assessment routes must be completed**

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QENM2/001	Complying with Statutory Regulations and Organisational Safety Requirements	2	5	35	A/601/5013
QENM2/002	Using and Interpreting Engineering Data and Documentation	2	5	25	Y/601/5102
QENM3/003	Carrying out Engineering Activities Efficiently and Effectively	3	5	25	K/601/5055
QENM3/004	Handing Over and Confirming Completion of Maintenance or Installation Activities	3	20	35	T/600/5516

**Optional assessment route: The following assessment route must be taken:**

QENM3/023	Carrying Out Fault Diagnosis on Engineered Systems	3	53	95	L/600/6011
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**Plus two assessment routes from the following:**

QENM3/024	Maintaining Mechanical Equipment within an Engineered System	3	81	161	Y/600/5413
QENM3/025	Maintaining Electrical Equipment within an Engineered System	3	81	161	M/600/5417
QENM3/026	Maintaining Fluid Power Equipment within an Engineered System	3	81	161	A/600/5422
QENM3/027	Maintaining Process Controller Equipment within an Engineered System	3	81	161	Y/600/5427

**Plus one assessment route from the following:**

QENM3/028	Carrying Out Preventative Planned Maintenance on Engineered Systems	3	38	74	F/600/5440
QENM3/010	Carrying Out Condition Monitoring of Plant and Equipment	3	39	81	A/600/5582
QENM3/083	Assisting in the Installation of Equipment to Produce an Engineered System	3	48	161	T/600/5659

## Pathway EMF: Services Maintenance

**Mandatory assessment routes: All four assessment routes must be completed**

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QENM2/001	Complying with Statutory Regulations and Organisational Safety Requirements	2	5	35	A/601/5013
QENM2/002	Using and Interpreting Engineering Data and Documentation	2	5	25	Y/601/5102
QENM3/003	Carrying out Engineering Activities Efficiently and Effectively	3	5	25	K/601/5055
QENM3/004	Handing Over and Confirming Completion of Maintenance or Installation Activities	3	20	35	T/600/5516

**Optional assessment routes: Both of the following assessment routes must be taken:**

QENM3/029	Reading and Extracting Information from Service Drawings and Specifications	3	5	25	J/600/5469
QENM3/030	Carrying Out Fault Diagnosis on Services and Systems	3	50	60	R/600/5474

**Plus two assessment routes from the following:**

QENM3/031	Maintaining Fresh Water Distribution Systems and Equipment	3	70	119	K/600/5481
QENM3/032	Maintaining Waste/Foul Water Distribution Systems and Equipment	3	70	119	H/600/5494
QENM3/033	Maintaining Workplace Environmental Control Systems	3	70	119	T/600/5497
QENM3/034	Maintaining Emergency Power Generation Equipment	3	70	119	T/600/5502
QENM3/035	Maintaining Heating and Ventilation Systems	3	70	119	L/600/5506
QENM3/036	Maintaining Air Conditioning and Ventilation Systems	3	70	119	H/600/5513
QENM3/037	Maintaining Gas Distribution Systems and Equipment	3	70	119	J/600/5519
QENM3/038	Maintaining Compressed Air Systems and Equipment	3	70	119	Y/600/5525

**Pathway EMF: Services Maintenance (cont)**

QENM3/039	Maintaining Process Control Systems	3	70	119	H/600/5530
QENM3/040	Maintaining Instrumentation and Control Systems	3	70	119	J/600/5536
QENM3/041	Maintaining Industrial Refrigeration Equipment	3	70	119	L/600/5540
QENM3/042	Maintaining Environmental Control Equipment	3	70	119	M/600/5546
QENM3/072	Maintaining Medical Device and Surgical Instrument Decontamination Equipment	3	70	119	K/600/5609
QENM3/073	Maintaining Medical Gas Pipeline Systems and Equipment	3	70	119	J/600/5617

**Plus one assessment route from the following:**

QENM3/043	Carrying Out Preventative Planned Maintenance on Services Systems and Equipment	3	38	74	F/600/5552
QENM3/010	Carrying Out Condition Monitoring of Plant and Equipment	3	39	81	A/600/5582
QENM3/084	Assisting in the Installation of Engineering Services Equipment	3	48	161	R/600/5667



## Pathway EMG: Lift Servicing

**Mandatory assessment routes: All four assessment routes must be completed**

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QENM2/001	Complying with Statutory Regulations and Organisational Safety Requirements	2	5	35	A/601/5013
QENM2/002	Using and Interpreting Engineering Data and Documentation	2	5	25	Y/601/5102
QENM3/003	Carrying out Engineering Activities Efficiently and Effectively	3	5	25	K/601/5055
QENM3/004	Handing Over and Confirming Completion of Maintenance or Installation Activities	3	20	35	T/600/5516

**Optional assessment routes: All of the following assessment routes must be taken:**

QENM3/044	Carrying Out Fault Diagnosis on Lifts	3	50	60	T/601/2224
QENM3/045	Inspecting and Servicing Lift Equipment	3	38	74	K/600/5495
QENM3/046	Checking Lift Function	3	50	60	R/600/5507
QENM3/047	Rectifying Faults in Lifts	3	47	91	A/600/5520

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Pathway EMH: Lift Repair

**Mandatory assessment routes: All four assessment routes must be completed**

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QENM2/001	Complying with Statutory Regulations and Organisational Safety Requirements	2	5	35	A/601/5013
QENM2/002	Using and Interpreting Engineering Data and Documentation	2	5	25	Y/601/5102
QENM3/003	Carrying out Engineering Activities Efficiently and Effectively	3	5	25	K/601/5055
QENM3/004	Handing Over and Confirming Completion of Maintenance or Installation Activities	3	20	35	T/600/5516

**Optional assessment routes: All of the following assessment routes must be taken:**

QENM3/044	Carrying Out Fault Diagnosis on Lifts	3	50	60	T/601/2224
QENM3/046	Checking Lift function	3	50	60	R/600/5507
QENM3/047	Rectifying Faults in Lifts	3	47	91	A/600/5520
QENM3/048	Repairing/Replacing Lift Doors, Chains, Ropes and Equipment	3	47	91	A/600/5534

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**Pathway EMI: Escalator Repair and Service**

**Mandatory assessment routes: All four assessment routes must be completed**

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QENM2/001	Complying with Statutory Regulations and Organisational Safety Requirements	2	5	35	A/601/5013
QENM2/002	Using and Interpreting Engineering Data and Documentation	2	5	25	Y/601/5102
QENM3/003	Carrying out Engineering Activities Efficiently and Effectively	3	5	25	K/601/5055
QENM3/004	Handing Over and Confirming Completion of Maintenance or Installation Activities	3	20	35	T/600/5516

**Optional assessment routes: All of the following assessment routes must be taken:**

QENM3/049	Carrying Out Fault Diagnosis on Escalators	3	50	60	R/600/5541
QENM3/050	Rectifying Faults in Escalators	3	47	91	R/600/5555
QENM3/051	Inspecting and Servicing Escalators	3	38	74	R/600/5457
QENM3/052	Testing and Reinstating Escalator Installations	3	46	56	T/600/5564



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## Pathway EMJ: Communication Electronics

### Mandatory assessment routes: All four assessment routes must be completed

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QENM2/001	Complying with Statutory Regulations and Organisational Safety Requirements	2	5	35	A/601/5013
QENM2/002	Using and Interpreting Engineering Data and Documentation	2	5	25	Y/601/5102
QENM3/003	Carrying out Engineering Activities Efficiently and Effectively	3	5	25	K/601/5055
QENM3/004	Handing Over and Confirming Completion of Maintenance or Installation Activities	3	20	35	T/600/5516

### Optional assessment routes: One of the following assessment routes must be taken:

QENM3/016	Carrying Out Fault Diagnosis on Electronic Equipment and Circuits	3	50	60	Y/600/5671
QENM3/053	Carrying Out Fault Diagnosis on Communication Electronic Systems	3	50	60	Y/600/5573

### Plus two assessment routes from the following:

QENM3/017	Testing Electronic Equipment and Circuits	3	50	60	A/600/5677
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### OR (but not both):

QENM3/054	Testing Communication-Electronic Systems	3	50	60	A/600/5579
QENM3/018	Repairing Electronic Equipment	3	62	81	D/600/5946

### OR (but not both):

QENM3/055	Repairing Communication-Electronic Systems	3	62	81	M/600/5465
QENM3/056	Carrying Out Preventative Planned Maintenance on Communication	3	38	74	D/600/5476
QENM3/057	Modifying Communication	3	35	63	L/600/5585
QENM3/058	Configuring Communication	3	51	77	Y/600/5590
QENM3/059	Installing Communication	3	32	81	J/600/5598

## Pathway EMK: Servicing Medical Equipment

### Mandatory assessment routes: All four assessment routes must be completed

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QENM2/001	Complying with Statutory Regulations and Organisational Safety Requirements	2	5	35	A/601/5013
QENM2/002	Using and Interpreting Engineering Data and Documentation	2	5	25	Y/601/5102
QENM3/003	Carrying out Engineering Activities Efficiently and Effectively	3	5	25	K/601/5055
QENM3/004	Handing Over and Confirming Completion of Maintenance or Installation Activities	3	20	35	T/600/5516

### Optional assessment routes: All of the following assessment routes must be taken:

QENM3/060	Carrying Out Fault Diagnosis on Medical Equipment	3	50	60	A/600/5601
QENM3/061	Testing Medical Equipment	3	50	60	H/600/5608
QENM3/062	Carrying Out Scheduled Servicing on Medical Equipment	3	38	74	A/600/5484

### Plus three assessment routes from the following:

QENM3/063	Servicing Cardiovascular Equipment	3	70	119	R/600/5491
QENM3/064	Servicing Physiological Monitoring and Infusion Equipment	3	70	119	F/600/5499
QENM3/065	Servicing Anaesthetic and Ventilation Equipment	3	70	119	Y/600/5508
QENM3/066	Servicing Operating Theatre and Surgical Equipment	3	70	119	F/600/5518
QENM3/067	Servicing Medical Imaging Equipment	3	70	119	T/600/5581
QENM3/068	Servicing Laboratory Equipment	3	70	119	R/600/5586
QENM3/069	Servicing Dental Equipment	3	70	119	D/600/5591
QENM3/070	Servicing Medical Therapeutic Equipment	3	70	119	F/600/5597
QENM3/071	Servicing Mechanical and Electromechanical Assistive Technology Equipment	3	70	119	F/600/5602

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## Pathway EMK: Servicing Medical Equipment (cont)

QENM3/086	Servicing radiotherapy equipment	3	70	119	M/506/6272
QENM3/087	Servicing on clinical computing equipment	3	70	119	K/506/6271

## Pathway EML: Instrumentation and Control

**Mandatory assessment routes: All four assessment routes must be completed**

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QENM2/001	Complying with Statutory Regulations and Organisational Safety Requirements	2	5	35	A/601/5013
QENM2/002	Using and Interpreting Engineering Data and Documentation	2	5	25	Y/601/5102
QENM3/003	Carrying out Engineering Activities Efficiently and Effectively	3	5	25	K/601/5055
QENM3/004	Handing Over and Confirming Completion of Maintenance or Installation Activities	3	20	35	T/600/5516

**Optional assessment routes: Both of the following assessment routes must be taken:**

QENM3/074	Carrying Out Fault Diagnosis on Instrumentation and Control Equipment and Circuits	3	50	60	Y/600/5637
QENM3/075	Maintaining Instrumentation and Control Equipment and Circuits	3	70	119	L/600/5621

**Plus two assessment routes from the following:**

QENM3/076	Carrying Out Preventative Planned Maintenance on Instrumentation and Control Equipment	3	38	74	T/600/5628
QENM3/077	Repairing/Overhauling Instrumentation and Control Equipment	3	47	91	M/600/5644
QENM3/078	Testing and Calibrating Instrumentation and Control Equipment and Circuits	3	50	60	J/600/5651
QENM3/085	Assisting in the Installation of Instrumentation and Control Equipment	3	48	161	F/600/6068

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