



Level 3 NVO Extended Diploma in

# Installation and Commissioning

# ENGINEERING

## Qualification Specification

### Overview

This qualification involves the skills and knowledge to work effectively in a range of installation and commissioning activities. It also includes level 2 Performing Engineering Operations (PEO) units to provide essential basic engineering training for apprentices in England and Wales.

### Typical Job

The qualification is applicable to a variety of engineering installation and commissioning occupations dependent on the pathway chosen.

Qualification code:	600/1650/4
Level:	3
Total qualification time:	1760
Guided learning hours:	425
Credits:	176
Minimum age	16

Issue 1.1

## Purpose of the qualification

### What does this qualification cover?

Four mandatory units, a choice of three PEO engineering practices or five PEO technical support units, and one of five job-specific pathways. These pathways cover a range of areas including equipment installation, commissioning, traction lift installation, hydraulic lift installation, and escalator installation and commissioning.

This qualification forms part of a Semta Apprenticeship.

## Who supports this qualification?

The qualification is supported by the Engineering Council, and recognised by the Institute of Mechanical Engineers (IMechE) for EngTech status.

## What could this qualification lead to?

Progress onto other engineering based qualifications such as:

- EAL Certificate and Diplomas in Engineering and Technology subjects
- EAL qualifications in Business-Improvement Techniques

## Entry Requirements

Learners must have the potential to achieve the assessment criteria set out in the units.

## 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 competence.

## Structure

The Extended Diploma is comprised of a Level 3 Engineering Qualification **extended** by inclusion of technically specific PEO Units as follows:-

**Mandatory Units** – A combination of Level 2 & 3

**Group A** - Level 2 PEO Units x 3

**OR**

**Group B** - Level 2 PEO Units x 5

**And**

**Group C** - One of the Installation and Commissioning pathways

### Delivery requirements

In the context of the Apprenticeship Framework, the technically specific level 2 PEO units **must** be delivered and assessed in a sheltered work environment **before** starting delivery and assessment of the level 3 components in the working environment.

### PEO:

To support these basic engineering skills and techniques, the learner must be trained in, and continuously practice the relevant Health and Safety, engineering communication requirements along with all the other Mandatory Unit(s) listed within that qualification. The Learner cannot be signed off as being competent for these units in this period.

### Level 3:

**On completion** of the PEO2 Units, the Learner moves on to the Units from the Level 3 qualification which can only be assessed within a workplace environment.

### EAL Level 3 NVQ Extended Diploma in Installation and Commissioning (QCF)

This qualification will be achieved when the learner has successfully completed the common mandatory Assessment route followed by the required number of optional Assessment route.

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

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QICM2/001	Complying with Statutory Regulations and Organisational Safety Requirements	2	5	35	A/601/5013
QICM2/002	Using and Interpreting Engineering Data and Documentation	2	5	25	Y/601/5102
QICM3/003	Working Efficiently and Effectively in Engineering	3	5	25	K/601/5055
QICM3/004	Handing Over and Confirming Completion of Installation or Commissioning Activities	3	20	35	D/601/0547

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## Group A (Engineering practices)

**Optional Units:** Learners must complete **three** more units from the following

### Notes:

Only one unit from **4, 32** and **61** may be included in the learner's choice of three units.

If unit **65** is selected units **5, 6, 8, 11, 12, 15, 16, 17** cannot be included in the learner's choice of three units.

If unit **66** is selected units **10, 22, 23, 25, 26, 27, 28, 29, 30, 34** cannot be included in the learner's choice of three units.

If unit **67** is selected units **33, 35, 36, 40** cannot be included in the learner's choice of three units.

If unit **68** is selected units **19, 21, 37, 38, 39, 40, 58, 59** cannot be included in the learner's choice of three units

QPE02/004	Producing Mechanical Engineering Drawings using a CAD System	2	11	61	F/504/6348
QPE02/005	Producing Components using Hand Fitting Techniques	2	14	64	J/504/6349
QPE02/006	Producing Mechanical Assemblies	2	15	68	F/504/6351
QPE02/007	Forming and Assembling Pipework Systems	2	14	64	L/504/6353
QPE02/008	Carrying Out Aircraft Detail Fitting Activities	2	14	64	R/504/6354
QPE02/009	Installing Aircraft Mechanical Fasteners	2	11	61	L/504/6367
QPE02/010	Producing Aircraft Detail Assemblies	2	14	65	L/504/6370
QPE02/011	Preparing and Using Lathes for Turning Operations	2	15	68	Y/504/6372
QPE02/012	Preparing and Using Milling Machines	2	15	68	K/504/6375
QPE02/013	Preparing and Using Grinding Machines	2	15	68	T/504/6377
QPE02/014	Preparing and Proving CNC Machine Tool Programs	2	14	64	F/504/6379
QPE02/015	Preparing and Using CNC Turning Machines	2	14	64	F/504/6382
QPE02/016	Preparing and Using CNC Milling Machines	2	14	64	L/504/6384
QPE02/017	Preparing and Using CNC Machining Centres	2	14	64	D/504/6387
QPE02/018	Preparing and Using Industrial Robots	2	14	64	D/504/6390
QPE02/019	Maintaining Mechanical Devices and Equipment	2	14	64	T/504/6394
QPE02/020	Assembling and Testing Fluid Power Systems	2	14	64	J/504/6397
QPE02/021	Maintaining Fluid Power Equipment	2	14	64	F/504/6401
QPE02/022	Producing Sheet Metal Components and Assemblies	2	14	64	J/504/6402
QPE02/023	Producing Platework Components and Assemblies	2	14	64	L/504/6403
QPE02/024	Cutting and Shaping Materials using Thermal Cutting Equipment	2	14	64	R/504/6404

QPE02/025	Preparing and Proving CNC Fabrication Machine Tool Programs	2	14	64	Y/504/6405
QPE02/026	Preparing and Using CNC Fabrication Machinery	2	14	64	D/504/6406
QPE02/027	Preparing and Using Manual Metal Arc Welding Equipment	2	15	68	K/504/6408
QPE02/028	Preparing and Using Manual TIG or Plasma-arc Welding Equipment	2	15	68	M/504/6409
QPE02/029	Preparing and Using Semi-automatic MIG, MAG and Flux cored arc Welding equipment	2	15	68	H/504/6410
QPE02/030	Preparing and Using Manual Oxy/fuel Gas Welding Equipment	2	14	64	Y/504/6419
QPE02/031	Preparing and Using Manual Flame Brazing and Braze Welding Equipment	2	11	61	L/504/6420
QPE02/032	Producing Electrical or Electronic Engineering Drawings using a CAD System	2	11	61	R/504/6421
QPE02/033	Wiring and Testing Electrical Equipment and Circuits	2	14	64	Y/504/6422
QPE02/034	Forming and Assembling Electrical Cable Enclosure and Support Systems	2	13	65	D/504/6423
QPE02/035	Assembling, Wiring and Testing Electrical Panels/Components Mounted in enclosures	2	14	64	H/504/6424
QPE02/036	Assembling and Testing Electronic Circuits	2	14	64	K/504/6425
QPE02/037	Maintaining Electrical Equipment/Systems	2	15	68	M/504/6426
QPE02/038	Maintaining Electronic Equipment/Systems	2	15	68	T/504/6427
QPE02/039	Maintaining and Testing Process Instrumentation and Control Devices	2	15	68	A/504/6428
QPE02/040	Wiring and Testing Programmable Controller Based Systems	2	15	68	F/504/6429
QPE02/041	Using Wood for Pattern, Modelmaking and Other Engineering Applications	2	15	68	T/504/6430
QPE02/042	Assembling Pattern, Model and Engineering Woodwork Components	2	14	64	A/504/6431
QPE02/043	Producing Composite Mouldings using Wet Lay-up Techniques	2	14	64	F/504/6432
QPE02/044	Producing Composite Mouldings using Pre-Preg Laminating Techniques	2	14	64	L/504/6434
QPE02/045	Producing Composite Mouldings using Resin Flow Infusion Techniques	2	14	64	R/504/6435
QPE02/046	Producing Composite Assemblies	2	14	64	Y/504/6436
QPE02/047	Producing Components by Rapid Prototyping Techniques	2	11	61	D/504/6437



QPE02/048	Producing and Preparing Sand Moulds and Cores for Casting	2	14	64	H/504/6438
QPE02/049	Producing and Preparing Molten Materials for Casting	2	14	64	K/504/6439
QPE02/050	Producing Cast Components by Manual Means	2	13	65	D/504/6440
QPE02/051	Fettling, Finishing and Checking Cast Components	2	11	61	H/504/6441
QPE02/052	Finishing Surfaces by Applying Coatings or Coverings	2	9	41	M/504/6443
QPE02/053	Finishing Surfaces by Applying Treatments	2	9	41	T/504/6444
QPE02/054	Carrying Out Heat Treatment of Engineering Materials	2	9	41	A/504/6445
QPE02/055	Carrying Out Hand Forging of Engineering Materials	2	9	41	F/504/6446
QPE02/056	Stripping and Rebuilding Motorsport Vehicles (Pre-Competition)	2	14	64	J/504/6447
QPE02/057	Inspecting a Motorsport Vehicle During Competition	2	14	64	L/504/6448
QPE02/058	Diagnosing and Rectifying Faults on Motorsport Vehicle Systems (During a Competition)	2	15	68	R/504/6449
QPE02/059	Carrying Out Maintenance Activities on Motor Vehicle Electrical Equipment	2	15	68	J/504/6450
QPE02/060	Stripping and Rebuilding Motorsport Engines (Pre – Competition)	2	14	64	L/504/6451
QPE02/061	Producing CAD Models (Drawings) using a CAD System	2	11	61	R/504/6452
QPE02/065	General Machining, Fitting and Assembly Applications	2	12	55	K/504/6456
QPE02/066	General Fabrication and Welding Applications	2	12	55	M/504/6457
QPE02/067	General Electrical and Electronic Engineering Applications	2	12	55	T/504/6458
QPE02/068	General Maintenance Engineering Applications	2	12	55	A/504/6459
QPE02/069	Joining Public Service Vehicle Components by Mechanical Processes	2	11	61	L/503/4056
QPE02/070	Assembling Structural Sub Assemblies to Produce a Public Service Vehicle	2	14	64	R/503/4057
QPE02/071	Fitting Sub Assemblies and Components to Public Service Vehicles	2	14	64	Y/503/4058
QPE02/072	Preparing and Manoeuvring Armoured Fighting Vehicles AFVs for Maintenance and Transportation	2	14	64	R/503/7198



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QPE02/073	Producing Composite Mouldings using Resin Film Infusion Techniques	2	14	64	J/504/3404
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Or

**Group B:**

**Learners must complete one of the following PEO Level 2 assessment routes:**

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QPE02/004	Producing Mechanical Engineering Drawings using a CAD System	2	11	61	F/504/6348
QPE02/032	Producing Electrical or Electronic Engineering Drawings using a CAD System	2	11	61	R/504/6421
QPE02/061	Producing CAD Models (Drawings) using a CAD System	2	11	61	R/504/6452

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**Plus two from the following PEO Level 2 assessment routes:**

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QPE02/062	Producing Engineering Project Plans	2	8	37	Y/504/6453
QPE02/063	Using Computer Software Packages to Assist with Engineering Activities	2	8	37	D/504/6454
QPE02/064	Conducting Business Improvement Activities	2	8	41	H/504/6455

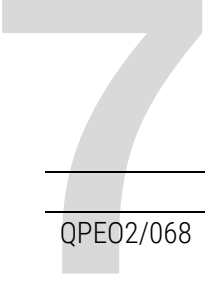
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**Plus two more from the following PEO Level 2 assessment routes:**

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QPE02/065	General Machining, Fitting and Assembly Applications	2	12	55	K/504/6456
QPE02/066	General Fabrication and Welding Applications	2	12	55	M/504/6457
QPE02/067	General Electrical and Electronic	2	12	55	T/504/6458

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	Engineering Applications				
QPE02/068	General Maintenance Engineering Applications	2	12	55	A/504/6459

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In addition to the PEO Level 2 unit requirement in Group A or B, learners must complete the unit requirements for one of the following Level 3 Installation and Commissioning Pathways

Group C:

Pathway ICA: Equipment Installation

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

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QICM3/005	Installing Mechanical Equipment	3	118	224	K/601/0549
QICM3/006	Installing Electrical/Electronic Equipment	3	118	224	D/601/0550
QICM3/007	Installing Equipment to Produce an Engineered System	3	123	259	M/601/0553
QICM3/008	Installing Instrumentation and Control Equipment	3	115	196	A/601/0555
QICM3/009	Installing Fluid Power Equipment	3	115	196	J/601/0557
QICM3/010	Installing Process Controller Equipment	3	118	224	L/601/0558
QICM3/011	Installing Emergency Electrical Power Generation Equipment	3	114	182	R/601/0559
QICM3/012	Installing Environmental Pollution Control Equipment	3	114	182	J/601/0560
QICM3/013	Installing Workplace Environmental Control Equipment	3	118	224	L/601/0561
QICM3/014	Installing Heating and Ventilation Equipment	3	118	224	R/601/0562
QICM3/015	Installing Air Conditioning and Ventilation Equipment	3	118	224	D/601/0564
QICM3/016	Installing Compressed Air Equipment	3	114	182	H/601/0565
QICM3/017	Installing Waste/Foul Water Distribution Equipment	3	114	182	K/601/0566
QICM3/018	Installing Fresh Water Distribution Equipment	3	114	182	M/601/0567
QICM3/019	Installing Refrigeration Equipment	3	114	182	A/601/0572



Pathway ICB: Commissioning

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

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QICM3/020	Commissioning Mechanical Equipment and Systems	3	118	224	F/601/0573
QICM3/021	Commissioning Electrical/Electronic Equipment and Systems	3	118	224	J/601/0574
QICM3/022	Commissioning Engineered Systems	3	123	259	L/601/0575
QICM3/023	Commissioning Process Controller Equipment and Systems	3	118	224	R/601/0576
QICM3/024	Commissioning Instrumentation and Control Equipment and Systems	3	115	196	R/601/0626
QICM3/025	Commissioning Fluid Power Equipment and Systems	3	115	196	Y/601/0627
QICM3/026	Commissioning Emergency Electrical Power Generation Equipment and Systems	3	114	182	D/601/0628
QICM3/027	Commissioning Environmental Pollution Control Equipment and Systems	3	114	182	D/601/0631
QICM3/028	Commissioning Workplace Environmental Control Equipment and Systems	3	118	224	H/601/0632
QICM3/029	Commissioning Heating and Ventilation Equipment and Systems	3	118	224	J/601/0638
QICM3/030	Commissioning Air Conditioning and Ventilation Equipment and Systems	3	118	224	L/601/0642
QICM3/031	Commissioning Compressed Air Equipment and Systems	3	114	182	Y/601/0644
QICM3/032	Commissioning Waste/Foul Water Distribution Equipment and Systems	3	114	182	K/601/0650
QICM3/033	Commissioning Fresh Water Distribution Equipment and Systems	3	114	182	F/601/0654
QICM3/034	Commissioning Refrigeration Equipment and Systems	3	114	182	Y/601/0658

## Pathway ICC: Traction Lift Installation

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

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QICM3/035	Carrying Out Fault Diagnosis on Lift Installations	3	50	60	R/601/0660
QICM3/036	Measuring and Setting Out Lift Installations	3	23	63	M/601/0665
QICM3/037	Installing Lift Well and Ancillary Equipment	3	25	84	A/601/0667
QICM3/038	Installing Traction Lift Equipment	3	25	84	F/601/0668
QICM3/039	Installing Lift Ropes and Chains	3	25	84	J/601/0669
QICM3/040	Installing Lift Doors, Frames and Ancillary Components	3	25	84	J/601/0672
QICM3/041	Checking and Setting Lift Installations	3	25	77	L/601/0673

## Pathway ICD: Hydraulic Lift Installation

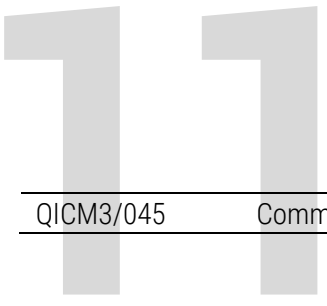
Optional assessment routes: All of the following assessment routes must be taken:

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QICM3/035	Carrying Out Fault Diagnosis on Lift Installations	3	50	60	R/601/0660
QICM3/036	Measuring and Setting Out Lift Installations	3	23	63	M/601/0665
QICM3/037	Installing Lift Well and Ancillary Equipment	3	25	84	A/601/0667
QICM3/039	Installing Lift Ropes and Chains	3	25	84	J/601/0669
QICM3/040	Installing Lift Doors, Frames and Ancillary Components	3	25	84	J/601/0672
QICM3/041	Checking and Setting Lift Installations	3	25	77	L/601/0673
QICM3/042	Installing Hydraulic Lift Equipment	3	25	84	R/601/0674

## Pathway ICE: Escalator Installation and Commissioning

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

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QICM3/043	Carrying Out Fault Diagnosis on Escalator Installations	3	50	60	H/601/0677
QICM3/044	Installing Escalator Equipment	3	33	161	H/601/0680



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QICM3/045	Commissioning Escalator Installations	3	100	182	A/601/0684
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