



MAKING THINGS HAPPEN.



Skilled worker
careers information – Wales

So, when was the last time you had a really Good Day? This week? Last week? Last month? Can't remember? You can find your ideal job within building services engineering, one that you actually enjoy... Imagine that!

From installing a light display for 40,000 people at a music festival, creating unique environmental systems or bringing buildings and homes to life, the opportunities are endless.

In this booklet you'll find out about the wide range of options available to you and how you can have a Good Day, every day, in your new career.

Also see our separate technician and graduate booklet which includes information on careers such as design engineer, estimator, contract or project manager and much more...

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01 What is building services engineering?

Building services engineering is hugely important. It has a direct impact on everything we do.

Without it, buildings would be too cold in winter and too hot in summer. There'd be no electricity to power our lights and computers; running water would be unheard of; and nipping down to the local shop to grab something for dinner would be impossible as there would be no fridges or freezers – we'd have to buy fresh food every day and eat it in our cold, dark, toilet-less homes.

Sounds bleak without it, doesn't it?

Not only is building services engineering vital to the way we live, as a career path it offers hundreds of exciting and challenging opportunities in these industries:

- air conditioning and refrigeration
- electrotechnical
- heating and ventilating
- plumbing

It is the job of people working in building services engineering to design, install and maintain the facilities that allow all of us to live and work in comfort and safety.

The sector needs a constant supply of highly skilled and professional people with an environmental conscience, willing to undertake the world-class training and qualifications that are on offer.

But it doesn't stop there: employers make a real commitment to their workforces and spend a lot of time and money on professional development and short courses to teach the skills needed to meet fresh challenges.

There are over 60,000 building services engineering businesses. Between them they employ over half a million people and have an annual turnover of £19.3 billion. They range from multi-million pound companies to small organisations and sole proprietors.

The sector of the future

Building services engineering never stands still and right now it's taking the lead in environmentally-friendly technology. Climate change is now affecting our everyday lives and it's the people working in building services engineering that are tackling these challenges head-on. As well as designing and installing energy-efficient systems, the sector is at the forefront of developing environmental technology such as solar thermal hot water, photovoltaics and micro-wind turbines to name just a few.



“Building services engineering caught my imagination because there's huge scope to work in all sorts of different areas – even abroad.”

Christopher Jenkins
Electrical Apprentice, RDM Electrical Services

02 Apprenticeships, training, and how to get into building services engineering

As building services engineering has some of the most comprehensive apprenticeships available, you'll be well prepared for your future career within the sector. They are:

- Intermediate Level Apprenticeship leading to a Level 2 NVQ Diploma; and
- Advanced Level Apprenticeship leading to a Level 3 NVQ Diploma

Highly respected by employers, both apprenticeship programmes are designed to give you the underpinning knowledge and skills you need to work effectively and professionally when on site.

Examples of formal qualifications that could indicate you would be suitable for an apprenticeship are GCSE grades A-C; relevant technical or relevant vocational GNVQs; an 'Access to Building Services Engineering' qualification; or a Welsh Baccalaureate.

Training

There's a lot to learn. And it takes years to become fully trained. Training includes:

- off-the-job training – such as college or training centre learning, and
- on-the-job training – this is where you apply the skills and knowledge gained at college or a training centre while working for your employer

Generally training will take between 2 and 4 years to complete, depending upon the apprenticeship scheme you decide to take.

If you are unable to do an apprenticeship, you are still expected to work towards an NVQ Level 2 or 3, depending on your occupation and job role. To gain an NVQ you must be in employment or have the ability to be assessed on site, carrying out work on real installations. You should be prepared to gain your qualification over a number of years – there's no quick fix to gaining the required qualifications in this highly technical sector.





03 What is Air Conditioning and Refrigeration?

From maintaining a comfortable air temperature and humidity in a multi-screen cinema, to keeping blood at the right temperature for lifesaving operations, the air conditioning and refrigeration industry has become a fundamental part of our lives.

Highly skilled and very technical, the industry requires committed and enthusiastic people to install, service and maintain the systems we take for granted.

It's also an industry that takes its responsibilities to the environment very seriously. As an air conditioning or refrigeration engineer, your technical knowledge and practical skills will ensure that products such as heat pumps and refrigerant gasses are handled in a safe and eco-friendly way, and will reduce the impact on the environment as much as possible.

Air Conditioning and Refrigeration occupations

Occupation	Key Specialist Activities. You will:	Key Common Activities
Refrigeration Installer/Service & Maintenance Operative	Install, service and maintain refrigeration systems throughout the UK in places such as supermarkets, hospitals, food processing and research establishments	Across both occupations, you will be: <ul style="list-style-type: none"> Working safely Working in an environmentally friendly manner Undertaking preparatory work
Air Conditioning Installer/Service & Maintenance Operative	Install, service and maintain systems and equipment safely which control, and maintain the quality, temperature and humidity of air within modern buildings	<ul style="list-style-type: none"> Inspecting, testing, certifying and commissioning Identifying and rectifying faults Providing functional and technical information Maintaining working relationships Overseeing work activities



“This is one of the things I love about the job – the variety and the fact that no two days are the same. And when I’m out on-site I feel as if I’m learning all the time.”

Martin Davey
Refrigeration and Air Conditioning Apprentice, Chilltec Refrigeration

What qualities and skills do you need?

The air conditioning and refrigeration industry is keen to attract new entrants from a diverse range of backgrounds. The typical qualities and skills required are:

- an aptitude for technical subjects or be practically orientated
- an interest in technology
- an ability to solve practical problems
- motivation to succeed within the industry/sector
- willingness to learn and apply that learning in the workplace/job role
- enthusiasm and attitude to work
- potential to complete the qualifications which are part of the apprenticeship programmes
- ability to communicate effectively with a range of people
- be numerate and literate
- have good colour vision to recognise colour coded wires and components
- ability to work at heights or in confined spaces
- willingness to undergo a police check (for example when working with children and vulnerable adults)

Additional skills and qualities for the Level 3 NVQ Diploma are:

- ability to plan and organise the work of others
- ability to motivate others
- good analytical skills
- good evaluation skills

Qualifications

The table below shows the recognised qualifications for air conditioning and refrigeration occupations and the requirements of the apprenticeship frameworks. The air conditioning and refrigeration industry requires you to have an NVQ Level 2 and 3 to achieve qualified operative status, depending on the level of responsibility and the complexity of systems being worked on. New entrants need to complete both the technical certificate and the NVQ in order to be classed as a qualified operative.

Foundation Modern Apprenticeship requirements

Competence Qualification:	NVQ Level 2 MES Small Commercial Refrigeration and Air Conditioning Systems, in either: <ul style="list-style-type: none"> Installation, or Service and Maintenance
Essential Skills:	Application of Number Level 2 Communication Level 2 Information Technology Level 1
Other Learning:	Employment Rights and Responsibilities Safe Handling of Refrigerants

Modern Apprenticeship requirements

Competence Qualification:	NVQ Level 3 MES Refrigeration and Air Conditioning Systems in either: <ul style="list-style-type: none"> Commercial and Industrial Air Conditioning, or Commercial and Industrial Refrigeration (non-ammonia), or Commercial and Industrial Refrigeration (Ammonia Refrigeration Systems)
Essential Skills:	Application of Number Level 2 Communication Level 2 Information Technology Level 1
Other Learning:	Employment Rights and Responsibilities Safe Handling of Refrigerants

Further Information

Industry Organisations:

Air Conditioning and Refrigeration Industry Board:
www.acrib.org.uk
Heating and Ventilating Contractors' Association:
www.hvca.org.uk

For information on apprenticeships in air conditioning and refrigeration contact:

BEST:
www.best-ltd.co.uk or
telephone 0800 917 8419

Your local college – many colleges have apprenticeship management departments

Careers Wales:
www.careerswales.com



04 What is Electrotechnical?

This is a diverse and exciting industry at the cutting-edge of installing, commissioning and maintaining technology in all types of building, including:

- complex projects such as shopping, sports stadiums, hospitals and new housing projects
- advanced data-cabling, data-handling systems and fibre-optic systems
- computer controlled building management systems
- renewable energy systems, like wind turbines or photovoltaics
- control equipment for complex industrial manufacturing and processing.

The electrotechnical industry is professional, responsible and future proof. It offers a guaranteed future, a full career path from school-leaver to professional qualifications, and good pay.

From domestic work to major engineering projects – the electrotechnical world provides a variety of jobs that few others can match. As an electrotechnical worker you will have numerous choices about the type of work you do and the career progression route you take.

Electrotechnical occupations

Occupation	Key Specialist Activities. You will:	Key Common Activities
Installation Electrician (Buildings & Structures)	Install power, lighting, fire protection, security and structured cabling	Across all occupations, you will be:
Electrotechnical Panel Builder	Build the control panels that control building management systems and industrial processes	<ul style="list-style-type: none"> • Working safely • Working in a environmentally friendly manner • Undertaking preparatory work • Inspecting, testing, certifying and commissioning • Identifying and rectifying faults • Providing functional and technical information • Maintaining working relationships • Overseeing work activities
Machine Repair and Rewind Electrician	Repair and maintain electrical motors, which drive equipment and machinery such as, compressors, pumps and fans within buildings	
Maintenance Electrician	Maintain modern electrical systems and the equipment they serve to ensure effective and efficient operation	
Highway Systems Installer	Install and maintain street lighting and traffic management systems	

What qualities and skills do you need?

The electrotechnical industry is keen to attract new entrants from a diverse range of backgrounds. The typical qualities and skills required are:

- an aptitude for technical subjects or be practically orientated
- an interest in technology
- an ability to solve practical problems
- motivation to succeed within the industry/sector
- willingness to learn and apply that learning in the workplace/job role
- enthusiasm and attitude to work
- potential to complete the qualifications which are part of the apprenticeship programmes
- ability to communicate effectively with a range of people
- be numerate and literate
- have good colour vision to recognise colour coded wires and components
- ability to work at heights or in confined spaces
- willingness to undergo a police check (for example when working with children and vulnerable adults)

Qualifications

The table below shows the recognised qualifications for electrotechnical occupations and the requirements of the apprenticeship frameworks. The electrotechnical industry requires you to have an NVQ Level 3 to achieve qualified operative status. New entrants need to complete both the technical certificate and the NVQ in order to be classed as a qualified operative.

Foundation Modern Apprenticeship requirements

Competence Qualifications: NVQ Level 2 Installing Electrotechnical Systems, or NVQ Level 2 Installing Highway Electrical Systems

Essential Skills: Application of Number Level 2
Communication Level 2
Information Technology Level 1

Other Learning: Employment Rights and Responsibilities

Modern Apprenticeship requirements

Competence Qualifications: NVQ Level 3 Electrotechnical Services in either:

- Electrical Installation – Building and Structures, or
- Electrical Maintenance, or
- Installing Instrumentation, or
- Highway Electrical Systems, or

NVQ Level 3 Electrotechnical Panel Building, or
NVQ Level 3 Electrical Machine Rewind and Repair

Essential Skills: Application of Number Level 2
Communication Level 2
Information Technology Level 1

Other Learning: Practical Performance Assessment Level 3
Employment Rights and Responsibilities

Further information

Industry Organisations:

The Electrical Contractors' Association:
www.eca.co.uk

The Joint Industry Board for the Electrical Contracting Industry:
www.jib.org.uk

For information on electrotechnical apprenticeships contact:

BEST:
www.best-ltd.co.uk or
telephone 0800 917 8419

JTL:
www.jtltraining.com or
telephone 0800 0852308

Your local college – many colleges have apprenticeship management departments

Careers Wales:
www.careerswales.com



05 What is Heating and Ventilating?

From the grilles you can see on a classroom wall, to the large networks of pipes that criss-cross factory ceilings, clues to how buildings work are all around us. Every where we go, whether it's a shop, an office, even a laboratory, we see the precise and complicated systems that make those buildings work.

The heating and ventilating industry installs innovative systems and new technologies such as air and ground source heat pumps to make a building as energy efficient as possible. But this is no easy task: it requires highly trained people who have the ability to adapt and apply their skills to install these complex systems:

- Pipework and ductwork installers use their skills to cut, form, weld, and join a wide range of materials used within a system
- Control and commissioning engineers use their knowledge to ensure systems meet the design requirements for the building
- Maintenance engineers identify faults, fix them and, more importantly, plan and carry out service and maintenance activities on systems, to make sure they work efficiently and effectively.

Heating & Ventilating occupations

Occupation	Key Specialist Activities. You will:	Key Common Activities
Heating Installer	Install complex heating equipment and pipework systems to exact design specifications within large buildings such as office blocks, hospitals, schools etc.	Across all occupations, you will be: <ul style="list-style-type: none"> • Working safely • Working in an environmentally friendly manner • Undertaking preparatory work
Ductwork Installer	Install complex ductwork and ventilation systems to exact design specifications within large buildings	<ul style="list-style-type: none"> • Inspecting, testing and commissioning • Identifying and rectifying faults
Service and Maintenance Engineer	Develop service and maintenance programs and carry out regular maintenance and repairs on all heating and ventilating systems and equipment	<ul style="list-style-type: none"> • Providing functional and technical information • Maintaining working relationships • Overseeing work activities

What qualities and skills do you need?

The heating and ventilating industry is keen to attract new entrants from a diverse range of backgrounds. The typical qualities and skills required are:

- an aptitude for technical subjects or be practically orientated
- an interest in technology
- an ability to solve practical problems
- motivation to succeed within the industry/sector
- willingness to learn and apply that learning in the workplace/job role
- enthusiasm and attitude to work
- potential to complete the qualifications which are part of the apprenticeship programmes
- ability to communicate effectively with a range of people
- be numerate and literate
- have good colour vision to recognise colour coded wires and components
- ability to work at heights or in confined spaces
- willingness to undergo a police check (for example when working with children and vulnerable adults)

Additional Skills and qualities for the Level 3 NVQ diploma are:

- the ability to plan and organise the work of others
- the ability to motivate others
- good analytical skills
- good evaluation skills

Qualifications

The table below shows the recognised qualifications for heating and ventilating occupations and the requirements of the apprenticeship frameworks. The heating & ventilating industry requires you to have an NVQ Level 2 and 3 to achieve qualified operative status, depending on the level of responsibility and the complexity of systems being worked on. New entrants need to complete both the technical certificate and the NVQ in order to be classed as a qualified operative.

Foundation Modern Apprenticeship requirements

Competence Qualifications:	Level 2 NVQ Diploma in Heating & Ventilating - Industrial & Commercial Installation; or Level 2 NVQ Diploma in Heating & Ventilating - Ductwork Installation; or Level 2 NVQ Diploma in Planned & Reactive Maintenance on Heating & Ventilating Equipment
Essential Skills:	Application of Number Level 2 Communication Level 2 Information Technology Level 1
Other Learning:	Employment Rights and Responsibilities

Modern Apprenticeship requirements

Competence Qualifications:	Level 3 NVQ Diploma in Heating & Ventilating - Ductwork Installation; or Level 3 NVQ Diploma in Heating & Ventilating - Industrial & Commercial Installation; or Level 3 NVQ Diploma in Planned and Reactive Maintenance on Heating & Ventilating Systems
Essential Skills:	Application of Number Level 2 Communication Level 2 Information Technology Level 1
Other Learning:	Employment Rights and Responsibilities

Further information

Industry Organisations:
Heating and Ventilating Contractors' Association:
www.hvca.org.uk

For information on apprenticeships in heating and ventilating contact:
BEST:
www.best-ltd.co.uk or
telephone 0800 917 8419

JTL:
www.jtltraining.com or
telephone 0800 0852308
Your local college
- many colleges
have apprenticeship
management departments
Careers Wales:
www.careerswales.com



06 What is Plumbing?

Imagine you had to light a fire in your home to keep warm. Or washing your hands meant collecting cold water from a well at the end of the street. Sounds silly to us now, but plumbers are responsible for the comfortable, hygienic and safe environments in which we live, work and relax.

Plumbing is a responsive and continually developing industry. In recent years environmental technologies have been integrated within the industry and the modern plumber now undertakes a huge variety of jobs, including:

- installing and maintaining central heating systems, hot and cold water systems and drainage systems
- installing, commissioning and maintaining solar water heating, rainwater harvesting or grey water recycling systems
- installing and maintaining gas, oil and solid fuel appliances.

Plumbing offers you a rewarding future, a full career path leading to professional qualifications, and good pay. No two days are the same – from changing a tap washer to installing a solar powered hot water system, plumbers work on domestic, commercial and industrial projects that offer variety and challenge.

Plumbing occupations

Occupation	Key Specialist Activities You will:	Key Common Activities
Domestic Plumber Level 2 NVQ	Install non-complex cold water, hot water, sanitation, rainwater, wet central heating systems and sheet lead weathering systems	Across all occupations, you will be: <ul style="list-style-type: none"> • Working safely • Working in an environmentally friendly manner
Domestic Plumber Level 3 NVQ	Install complex cold water, hot water, sanitation, heating systems and domestic fuel burning appliances such as gas, oil or solid fuel boilers Design systems Plan work activities Improve business products	<ul style="list-style-type: none"> • Undertaking preparatory work • Commissioning and decommissioning systems • Identifying and rectifying faults • Maintaining working relationships
Industrial and Commercial Plumber Level 3 NVQ	Install industrial and commercial heating, fuel supply, specialist appliances and fire protection systems	

What qualities and skills do you need?

The plumbing and domestic heating industry is keen to attract new entrants from a diverse range of backgrounds. The typical qualities and skills required are:

- an aptitude for technical subjects or be practically orientated
- an interest in technology
- an ability to solve practical problems
- motivation to succeed within the industry/sector
- willingness to learn and apply that learning in the workplace/job role
- enthusiasm and attitude to work
- potential to complete the qualifications which are part of the apprenticeship programmes
- ability to communicate effectively with a range of people
- be numerate and literate
- have good colour vision to recognise colour coded wires and components
- ability to work at heights or in confined spaces
- willingness to undergo a police check (for example when working with children and vulnerable adults)

Additional skills and qualities for the Level 3 NVQ Diploma are:

- the ability to plan and organise the work of others
- the ability to motivate others
- good analytical skills
- good evaluation skills

Qualifications

The table below shows the recognised qualifications for plumbing occupations and the requirements of the apprenticeship frameworks. The plumbing industry requires you to have an NVQ Level 2 and 3 to achieve qualified operative status, depending on the level of responsibility and the complexity of systems being worked on. New entrants need to complete both the technical certificate and the NVQ in order to be classed as a qualified operative.

Foundation Modern Apprenticeship requirements

Competence Qualification:	Level 2 NVQ Diploma in Domestic Heating Systems; or Level 2 NVQ Diploma in Plumbing & Heating
Essential Skills:	Application of Number Level 2 Communication Level 2
Other Learning:	Employment Rights and Responsibilities

Modern Apprenticeship requirements

Competence Qualifications:	Level 3 NVQ Diploma in Domestic Plumbing and Heating; or Level 3 NVQ Diploma in Domestic Heating; or Level 3 NVQ Diploma in Domestic Heating (Gas Fired warm air appliances) - EUSGU021; or Level 3 NVQ Diploma in Domestic Heating (Gas Fired water and central heating appliances) - EUSGU022;
Essential Skills:	Application of Number Level 2 Communication Level 2
Other Learning:	Employment Rights and Responsibilities



“I pride myself on the fact that I’ve never had a complaint about my work and seeing a happy customer gives me a real buzz.”

Alf Ramsay
Owner, Ramsay Plumbing & Heating

Further information

Industry organisations:

The Association of Plumbing and Heating Contractors:
www.aphc.co.uk

The Chartered Institute of Plumbing & Heating Engineering:
www.ciphe.org.uk

The Joint Industry Board for Plumbing Mechanical Engineering Services in England and Wales:
www.jib-pmes.org.uk

For information on apprenticeships in plumbing contact:

BEST:
www.best-ltd.co.uk or telephone 0800 917 8419

JTL:
www.jtltraining.com or telephone 0800 0852308

Your local college – many colleges have apprenticeship management departments

Careers Wales:
www.careerswales.com

Once you've completed your NVQ you'll be having a Good Day, every day, with industry recognition and the respect of your peers for your skills and ability. But more than that, you have also got a solid foundation to take your career wherever you want it to go.

You might decide to continue in your new role and take on more supervisory tasks as you gain experience. Or you might want to pass on your skills to people who join the sector. You could even move into a more technical role, such as design or project management.

You can do all of this by developing skills further – continually developing yourself through training courses, Higher National Certificates and Higher National Diplomas, or different types of degrees including foundation degrees, means that the sky is the limit for your career.

Take a look at our technician and graduate booklet for more career options, or check out the interactive careers map on our website, or the careers map poster, to see where your Good Day can take you.



To find out more about how you can have a Good Day, every day, in your new career, visit our website at www.goodday.org.uk or telephone the careers helpline on 08000 688 336.



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