

Plumbing & Domestic Heating Technician (2022 revision) apprenticeship standard

Reference: ST0303

Route: Construction & the Built Environment

Level: 3

Duration: 48 months

Qualifications: All apprentices will achieve a Level 3 Diploma in Plumbing & Domestic Heating prior to taking the end-point assessment. Apprentices taking the Domestic Gas Systems & Hot Water Heating Appliances option will be required to achieve the necessary requirements for registration on the Gas Safe Register during the end-point assessment.

Occupation summary

This occupation is found in the Building Services Sector of the Construction Industry. Plumbing and Domestic Heating Technicians plan, select, install, service, commission and maintain all aspects of plumbing and heating systems. Plumbing and domestic heating technicians can find themselves working inside or outside a property. Customer service skills and being tidy and respectful are important qualities as they can often find themselves working in customers' homes as well as on building sites.

All competent Plumbing and Heating Technicians are concerned with the installation, service and maintenance of plumbing and heating systems in dwellings and similar sized premises, these systems include hot and cold water, domestic central heating and above ground sanitation and drainage including rainwater systems, rainwater harvesting and greywater re-use. The work includes accurate measuring, marking, cutting, bending and jointing metallic and non-metallic pipework. and work with appliances and equipment which can include sanitary appliances, circulating pumps, heat emitters, hot water storage vessels and buffer tanks, bathroom furniture and electrical and mechanical controls as part of the above systems.

In addition to the above core knowledge and skills candidates entering the occupation must take one of three specialist pathways, these are:

Option 1. Domestic Gas Systems and Hot Water Heating Appliances Technician, which is concerned with the safe installation and maintenance of domestic natural gas systems and central heating and hot water appliances.

Option 2. Domestic Air Source Heat Pumps and Solar Thermal Systems Technician, which is concerned with the installation and maintenance of air source heat pumps and solar thermal hot water systems in domestic sized premises.

Option 3. Non-domestic Plumbing Technician, which is concerned with the installation and maintenance of plumbing systems in premises such as hospitals and health care premises, schools, high rise buildings, public buildings, industrial and commercial premises etc.

It is important for a plumbing and heating technician to be able to work independently or as part of a team and use their knowledge and skills to ensure that both the system and appliances are appropriately selected and correctly installed, often without any supervision,

and done so in a safe, efficient and economical manner to minimise waste.

Typical job titles include:

Plumber
Domestic Heating Engineer
Domestic Heating Installer
Plumbing and Domestic Heating Installer
Plumbing and Domestic Heating Engineer

Core Occupation Duties

Duty 1: Plan core plumbing and domestic heating systems to meet customers' needs and in accordance with manufacturers guidance, regulatory requirements and industry recognised standards and procedures.

Duty 2: Select and size core plumbing and domestic heating systems to meet customers' needs and in accordance with manufacturers guidance, regulatory requirements and industry recognised standards and procedures.

Duty 3: Carry out preparatory work for the Installation of core plumbing and domestic heating systems.

Duty 4: Install core plumbing and domestic heating systems in accordance with design criteria, manufacturers guidance, regulatory requirements and industry recognised standards and procedures.

Duty 5: Test and commission core plumbing and domestic heating system installations in accordance with manufacturers guidance, regulatory requirements and industry recognised standards and procedures.

Duty 6: Carry out appropriate handover procedures for core plumbing and domestic heating systems to customers and or end users including the provision of written information, diagrammatic information, verbal information and demonstration regarding system operation and use.

Duty 7: Carry out routine service and maintenance procedures on core plumbing and domestic heating systems.

Duty 8: Perform fault finding, diagnosis and rectification procedures on core plumbing and domestic heating systems.

Duty 9: Decommission core plumbing and domestic heating systems.

Duty 10: Conform to all health, safety and welfare in the workplace requirements.

Option 1, (Domestic Gas Systems and Hot Water Heating Appliances) Duties.

Duty 11: Plan low pressure natural gas systems (up to 35mm R1¼) to include natural gas fired central heating and hot water appliances (up to 70kW net heat input) to meet customers' needs and in accordance with manufacturers guidance, regulatory requirements and industry recognised standards and procedures.

Duty 12: Select and size low pressure natural gas systems (up to 35mm R1¼) to include natural gas fired central heating and hot water appliances (up to 70kW net heat input) to meet customers' needs and in accordance with manufacturers guidance, regulatory requirements and industry recognised standards and procedures.

Duty 13: Carry out preparatory work for the Installation of low pressure natural gas systems (up to 35mm R1¼) to include natural gas fired central heating and hot water appliances (up to

70kW net heat input).

Duty 14: Install low pressure natural gas systems (up to 35mm R1¼) to include natural gas fired central heating and hot water appliances (up to 70kW net heat input) in accordance with design criteria, manufacturers guidance, regulatory requirements and industry recognised standards and procedures.

Duty 15: Test and commission low pressure natural gas systems (up to 35mm R1¼) to include natural gas fired central heating and hot water appliances (up to 70kW net heat input) in accordance with manufacturers guidance, regulatory requirements and industry recognised standards and procedures.

Duty 16: Carry out appropriate handover procedures for low pressure natural gas systems (up to 35mm R1¼) to include natural gas fired central heating and hot water appliances (up to 70kW net heat input) to customers and or end users including the provision of written information, diagrammatic information, verbal information and demonstration regarding system operation and use.

Duty 17: Carry out routine service and maintenance procedures on low pressure natural gas systems (up to 35mm R1¼) to include natural gas fired central heating and hot water appliances (up to 70kW net heat input).

Duty 18: Perform fault finding, diagnosis and rectification procedures on low pressure natural gas systems (up to 35mm R1¼) to include natural gas fired central heating and hot water appliances (up to 70kW net heat input)

Duty 19: Decommission low pressure natural gas systems (up to 35mm R1¼) to include natural gas fired central heating and hot water appliances (up to 70kW heat input)

Option 2, (Domestic Air Source Heat Pumps and Solar Thermal Systems) Duties.

Duty 20: Plan environmental technology systems (air source heat pump appliances and solar thermal hot water systems) to meet customers' needs and in accordance with manufacturers guidance, regulatory requirements and industry recognised standards and procedures.

Duty 21: Select and size environmental technology systems (air source heat pump appliances and solar thermal hot water systems) to meet customers' needs and in accordance with manufacturers guidance, regulatory requirements and industry recognised standards and procedures.

Duty 22: Carry out preparatory work for the Installation of environmental technology systems (air source heat pump appliances and solar thermal hot water systems).

Duty 23: Install environmental technology systems (air source heat pump appliances and solar thermal hot water systems) in accordance with design criteria, manufacturers guidance, regulatory requirements and industry recognised standards and procedures.

Duty 24: Test and commission environmental technology systems (air source heat pump appliances and solar thermal hot water systems) in accordance with manufacturers guidance, regulatory requirements and industry recognised standards and procedures.

Duty 25: Carry out appropriate handover procedures for environmental technology systems (air source heat pump appliances and solar thermal hot water systems) to customers and or end users including the provision of written information, diagrammatic information, verbal information and demonstration regarding system operation and use.

Duty 26: Carry out routine service and maintenance procedures on environmental technology systems (air source heat pump appliances and solar thermal hot water systems).

Duty 27: Perform fault finding, diagnosis and rectification procedures on environmental

technology systems (air source heat pump appliances and solar thermal hot water systems).

Duty 28: Decommission environmental technology systems (air source heat pump appliances and solar thermal hot water systems).

Option 3, (Non-Domestic Plumbing) Duties.

Duty 29: Plan non-domestic plumbing systems to meet customers' needs and in accordance with manufacturers guidance, regulatory requirements and industry recognised standards and procedures.

Duty 30: Carry out preparatory work for the Installation of non-domestic plumbing systems.

Duty 31: Install non-domestic plumbing systems in accordance with design criteria, manufacturers guidance, regulatory requirements and industry recognised standards and procedures.

Duty 32: Test and commission non-domestic plumbing installations in accordance with manufacturers guidance, regulatory requirements and industry recognised standards and procedures.

Duty 33: Carry out appropriate handover procedures for non-domestic plumbing systems to customers and or end users including the provision of written information, diagrammatic information, verbal information and demonstration regarding system operation and use.

Duty 34: Carry out routine service and maintenance procedures on non-domestic plumbing systems.

Duty 35: Perform fault finding, diagnosis and rectification procedures on non-domestic plumbing systems.

Duty 36: Decommission non-domestic plumbing systems.

KSBs:

| KNOWLEDGE |
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| K1: Core. The health and safety legislation, approved Codes of Practice and guidance and safe working practices applicable to work in the building services and wider construction industry. |
| K2: Core. The common installation processes and techniques used in the installation and maintenance of plumbing and domestic heating systems (cold water systems, hot water systems, domestic wet central heating systems, sanitation systems and rainwater systems including rainwater harvesting and grey water reuse). |
| K3: Core. Scientific and mechanical principles applicable to plumbing and domestic heating systems work. |
| K4: Core. The roles and responsibilities of persons within the plumbing and domestic |

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heating systems industry and related trades.

K5: Core.

The legislative requirements and sources of information applicable to plumbing and domestic heating systems system installation, service and repair.

K6: Core.

How to communicate with customers, suppliers, co-workers. and members of the public who may come into contact with the work area.

K7: Core.

The layout features, working principles and legislative requirements of plumbing and domestic heating systems.

K8: Core.

The basic factors which influence system choice for particular applications with regard to the installation of plumbing and domestic heating systems.

K9: Core.

The installation requirements applicable to plumbing and domestic heating systems.

K10: Core.

The testing and commissioning requirements applicable to plumbing and domestic heating systems.

K11: Core.

The decommissioning procedures applicable to plumbing and domestic heating systems

K12: Core.

The routine service and maintenance procedures applicable to plumbing and domestic heating systems.

K13: Core.

The fault finding, diagnosis and rectification procedures applicable to plumbing and domestic heating systems.

K14: Core.

The procedures for sizing and selecting plumbing and domestic heating systems and components to meet customer's needs.

K15: Core.

The legislative requirements, processes and procedures of electrical supply and control systems applicable plumbing and domestic heating systems and work

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including limits to operative competence.

K16: Domestic Gas Systems and Hot Water Heating Appliances Technician.
The common installation processes and techniques used in the installation and maintenance of Natural Gas systems (up to 35mm R1¼) and Natural Gas fired hot water and central heating appliances (up to 70kW net heat input).

K17: Domestic Gas Systems and Hot Water Heating Appliances Technician.
The legislative requirements, approved codes of practice and guidance and sources of information applicable to the installation, service and repair of low pressure Natural Gas systems (up to 35mm R1¼) and Natural Gas fired hot water and central heating appliances (up to 70kW net heat input).

K18: Domestic Gas Systems and Hot Water Heating Appliances Technician.
The installation requirements (including system modification and extension) applicable to low pressure Natural Gas systems (up to 35mm R1¼) and Natural Gas fired hot water and central heating appliances (up to 70kW net heat input).

K19: Domestic Gas Systems and Hot Water Heating Appliances Technician.
The purging, testing and commissioning requirements applicable to low pressure Natural Gas systems (up to 35mm R1¼) and Natural Gas fired hot water and central heating appliances (up to 70kW net heat input).

K20: Domestic Gas Systems and Hot Water Heating Appliances Technician.
The decommissioning procedures (including disconnection and dismantling) applicable to low pressure Natural Gas systems (up to 35mm R1¼) and Natural Gas fired hot water and central heating appliances (up to 70kW net heat input).

K21: Domestic Gas Systems and Hot Water Heating Appliances Technician.
The routine service and maintenance procedures applicable to low pressure Natural Gas systems (up to 35mm R1¼) and Natural Gas fired hot water and central heating appliances (up to 70kW net heat input).

K22: Domestic Gas Systems and Hot Water Heating Appliances Technician.
The fault finding, diagnosis and rectification procedures applicable to low pressure Natural Gas systems (up to 35mm R1¼) and Natural Gas fired hot water and central heating appliances (up to 70kW net heat input).

K23: Domestic Gas Systems and Hot Water Heating Appliances Technician.
The procedures for sizing and selecting low pressure Natural Gas systems (up to 35mm R1¼) and Natural Gas fired hot water and central heating appliances (up to 70kW net heat input) to meet customer's needs, statutory legislation and approved codes of practice and guidance.

K24: Domestic Air Source Heat Pumps and Solar Thermal Systems Technician.
The common installation processes and techniques used in the installation and

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maintenance of air source heat pump (non-refrigerant circuits) systems

K25: Domestic Air Source Heat Pumps and Solar Thermal Systems Technician. The common installation processes and techniques used in the installation and maintenance of solar thermal hot water systems.

K26: Domestic Air Source Heat Pumps and Solar Thermal Systems Technician. The legislative requirements, approved codes of practice and guidance and sources of information applicable to the installation, service and repair of air source heat pump (non-refrigerant circuits) systems.

K27: Domestic Air Source Heat Pumps and Solar Thermal Systems Technician. The legislative requirements, approved codes of practice and guidance and sources of information applicable to the installation, service and repair of solar thermal hot water systems.

K28: Domestic Air Source Heat Pumps and Solar Thermal Systems Technician. The installation requirements (including retrofit) applicable to air source heat pump (non-refrigerant circuits) systems and components.

K29: Domestic Air Source Heat Pumps and Solar Thermal Systems Technician. The installation requirements (including retrofit) applicable to solar thermal hot water systems and components.

K30: Domestic Air Source Heat Pumps and Solar Thermal Systems Technician. The testing and commissioning requirements applicable to air source heat pump (non-refrigerant circuits) systems.

K31: Domestic Air Source Heat Pumps and Solar Thermal Systems Technician. The testing and commissioning requirements applicable to solar thermal hot water systems.

K32: Domestic Air Source Heat Pumps and Solar Thermal Systems Technician. The decommissioning procedures applicable to air source heat pump (non-refrigerant circuits) systems.

K33: Domestic Air Source Heat Pumps and Solar Thermal Systems Technician. The decommissioning procedures applicable to solar thermal hot water systems.

K34: Domestic Air Source Heat Pumps and Solar Thermal Systems Technician. The routine service and maintenance procedures applicable to air source heat pump (non-refrigerant circuits) systems.

K35: Domestic Air Source Heat Pumps and Solar Thermal Systems Technician. The routine service and maintenance procedures applicable to solar thermal hot

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water systems.

K36: Domestic Air Source Heat Pumps and Solar Thermal Systems Technician.
The fault finding, diagnosis and rectification procedures applicable to air source heat pump (non-refrigerant circuits) systems.

K37: Domestic Air Source Heat Pumps and Solar Thermal Systems Technician.
The fault finding, diagnosis and rectification procedures applicable to solar thermal hot water systems.

K38: Domestic Air Source Heat Pumps and Solar Thermal Systems Technician.
The procedures for sizing and selecting air source heat pump (non-refrigerant circuits) systems.

K39: Domestic Air Source Heat Pumps and Solar Thermal Systems Technician.
The procedures for sizing and selecting solar thermal hot water systems.

K40: Non-domestic Plumbing Technician.
The layout features, working principles and legislative requirements of plumbing pipework (above 28mm) and non-domestic plumbing systems and appliances.

K41: Non-domestic Plumbing Technician.
The factors which influence and apply to the installation of plumbing (above 28mm) and non-domestic plumbing systems and appliances.

K42: Non-domestic Plumbing Technician.
The installation requirements applicable to plumbing (above 28mm) and non-domestic plumbing systems and appliances.

K43: Non-domestic Plumbing Technician.
The testing and commissioning requirements applicable to plumbing (above 28mm) and non-domestic plumbing systems and appliances.

K44: Non-domestic Plumbing Technician.
The decommissioning procedures applicable to plumbing (above 28mm) and non-domestic plumbing systems and appliances.

K45: Non-domestic Plumbing Technician.
The routine service and maintenance procedures applicable to plumbing (above 28mm) and non-domestic plumbing systems and appliances.

K46: Non-domestic Plumbing Technician.
Fault finding, diagnosis and rectification procedures applicable to plumbing (above 28mm) and non-domestic plumbing systems and appliances.

SKILL

S1: Core.

Operate in a safe working manner by adhering to health and safety legislation, approved codes of practice and guidance and applying safe working practices.

S2: Core.

Carry out and apply the common installation processes and techniques used in the installation and maintenance of plumbing and domestic heating systems.

S3: Core.

Plan tasks within plumbing and domestic heating systems industry.

S4: Core.

Identify and document hazards for the plumbing and domestic heating systems work. Apply control measures.

S5: Core.

Install, test, commission and handover plumbing and domestic heating systems.

S6: Core.

Install, test, and commission, electrical and electrical control systems applicable to plumbing and domestic heating systems.

S7: Core.

Perform routine service, maintenance, fault diagnosis and rectification procedures and techniques on plumbing and domestic heating systems.

S8: Core.

Perform routine service, maintenance, fault diagnosis and rectification procedures and techniques on electrical and electrical control systems applicable to plumbing and domestic heating systems including industry safe isolation procedures.

S9: Core.

Decommission plumbing and domestic heating systems.

S10: Core.

Decommission electrical and electrical control systems applicable to plumbing and domestic heating systems.

S11: Core.

Plan, size and select plumbing and domestic heating systems to meet customer's needs in accordance with manufacturers guidance, regulatory requirements and industry recognised standards and procedures.

SKILL

S12: Domestic Gas Systems and Hot Water Heating Appliances Technician.
Carry out and apply the common installation processes and techniques used in the installation and maintenance of Natural Gas systems (up to 35mm R1¼) and Natural Gas fired hot water and central heating appliances (up to 70kW net heat input) in the workplace.

S13: Domestic Gas Systems and Hot Water Heating Appliances Technician.
Install, purge, test, commission and handover low pressure Natural Gas systems (up to 35mm R1¼) and Natural Gas fired hot water and central heating appliances (up to 70kW net heat input).

S14: Domestic Gas Systems and Hot Water Heating Appliances Technician.
Perform routine service, maintenance, fault diagnosis and rectification procedures and techniques on low pressure Natural Gas systems (up to 35mm R1¼) and Natural Gas fired hot water and central heating appliances (up to 70kW net heat input).

S15: Domestic Gas Systems and Hot Water Heating Appliances Technician.
Decommission (including disconnection and dismantling) low pressure Natural Gas systems (up to 35mm R1¼) and Natural Gas fired hot water and central heating appliances (up to 70kW net heat input).

S16: Domestic Gas Systems and Hot Water Heating Appliances Technician.
Plan, size and select low pressure Natural Gas systems (up to 35mm R1¼) and Natural Gas fired hot water and central heating appliances (up to 70kW net heat input).

S17: Domestic Air Source Heat Pumps and Solar Thermal Systems Technician.
Carry out and apply the common installation processes and techniques used in the installation and maintenance of air source heat pump (non-refrigerant circuits) systems.

S18: Domestic Air Source Heat Pumps and Solar Thermal Systems Technician.
Carry out and apply the common installation processes and techniques used in the installation and maintenance of solar thermal hot water systems.

S19: Domestic Air Source Heat Pumps and Solar Thermal Systems Technician.
Install, test, commission and handover air source heat pump (non-refrigerant circuits) systems.

S20: Domestic Air Source Heat Pumps and Solar Thermal Systems Technician.
Install, test, commission and handover solar thermal hot water systems.

S21: Domestic Air Source Heat Pumps and Solar Thermal Systems Technician.
Perform routine service, maintenance, fault diagnosis and rectification procedures

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and techniques on air source heat pump (non-refrigerant circuits) systems.

S22: Domestic Air Source Heat Pumps and Solar Thermal Systems Technician.
Perform routine service, maintenance, fault diagnosis and rectification procedures and techniques on solar thermal hot water systems.

S23: Domestic Air Source Heat Pumps and Solar Thermal Systems Technician.
Decommission (including disconnection and dismantling) air source heat pump (non-refrigerant circuits) systems.

S24: Domestic Air Source Heat Pumps and Solar Thermal Systems Technician.
Decommission (including disconnection and dismantling) air source heat pumps solar thermal hot water systems.

S25: Domestic Air Source Heat Pumps and Solar Thermal Systems Technician.
Plan, size and select air source heat pump (non-refrigerant circuits) systems.

S26: Domestic Air Source Heat Pumps and Solar Thermal Systems Technician.
Plan, size and select solar thermal hot water systems.

S27: Non-domestic Plumbing Technician.
Carry out and apply the common installation processes and techniques used in the installation and maintenance of plumbing (above 28mm) and non-domestic plumbing systems and appliances.

S28: Non-domestic Plumbing Technician.
Install, test, commission and handover plumbing pipework (above 28mm) and non-domestic plumbing systems and appliances in the workplace.

S29: Non-domestic Plumbing Technician.
Perform routine service, maintenance, fault diagnosis and rectification procedures and techniques on plumbing (above 28mm) and non-domestic plumbing systems and appliances.

S30: Non-domestic Plumbing Technician.
Decommission (including disconnection and dismantling) plumbing (above 28mm) and non-domestic plumbing systems and appliances.

BEHAVIOUR

B1: Core.
Acts professionally and ethically to collaborate with colleagues and customers.

BEHAVIOUR

B2: Core.

Takes ownership of work within limits of own competence, knowing when to seek advice or assistance.

B3: Core.

Committed to continuous professional development.

B4: Core.

Committed to keeping up to date with industry best practice.