

## Install gas fired ducted air heaters and appliances

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### Overview

This national occupational standard is for gas engineers who are required to install, exchange and remove domestic gas fired ducted air heaters and includes the following range of appliances: Down-flow, Up-flow, Horizontal-flow and Slot-fit warm air central heating units. This standard covers the work activities of planning, installing, exchanging, disconnecting, de-commissioning and commissioning those appliances.

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### Performance criteria

- You must be able to:*
- Plan and prepare work activities for gas fired ducted air heaters
  1. Identify, record and agree the customer's job requirements
  2. Compare the customer's job requirements with statutory and industry requirements and identify any conflicting issues
  3. Survey the work site and consult site diagrams as necessary for any key structural features and existing defects that could affect the installation and record them, advising property occupier of any defects found
  4. Check that the proposed siting of the appliance meets the manufacturers' and industry standards' requirements for location, siting and clearance
  5. Check size, location and availability of all necessary input services meet the appliance manufacturers' and industry standards' requirements for the installation including services and systems
  6. Check and ensure the design of the proposed installation is in compliance with industry standards
  7. Produce a risk assessment and method statement which incorporates safety provisions in the work site, access to the work site, movement of the workforce, members of the public, and the movement and safe storage of materials, tools and equipment for the job
  8. Protect the work site and the building fabric against possible damage being caused during the de-commissioning and installation process
  9. Check and confirm all materials, tools and equipment necessary for the de-commissioning, installation and commissioning process are available as required and are fit for purpose
  10. Confirm that the gas supply, electricity supply, the provision of ventilation and where required, the chimney suitability meet the appliance manufacturers' and industry standards' requirements for the installation
  11. Carry out all necessary checks and tests to confirm the gas supply, electricity supply and where required, the chimney system meet the manufacturers' and industry requirements for the installation
  12. Check existing installation for any unsafe appliances and system components and apply the gas industry unsafe situations procedures as required
- De-commission gas fired ducted air heaters to industry standards
13. Check that conditions within the gas and electricity systems will permit safe de-commissioning

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14. Select and use the correct tools and equipment for de-commissioning activities
15. Use designated safe isolation methods, tests, and procedures to de-commission gas and electricity systems and components
16. Take precautionary actions to ensure that temporarily de-commissioned appliances, systems, or components do not present a safety hazard
17. Permanently remove and disconnect appliances, gas system components and electricity system components as required

Install, exchange, and remove gas fired ducted air heaters to industry standards and manufacturers instructions

18. Carry out preparatory work to meet the manufacturers' installation requirements
19. Carry out the installation process minimising damage to customer property and building features
20. Select and use the correct tools and equipment for installation activities
21. Remove existing gas and electricity system components as required by the installation plan
22. Fabricate gas and electricity system components as required by the installation plan
23. Fabricate the new or existing duct system for the installation of the new appliance and system, or components, or for extending the duct system
24. Position the appliance and confirm it meets the location, siting and clearances required by the manufacturers' and industry standards' specification
25. Provide required ventilation for new or replacement appliance installations and systems
26. Ensure existing gas systems are clean and free of debris
27. Fix and connect gas and electricity system components to the appliance
28. Use tightness testing and purging procedures and electrical testing to confirm the integrity of the installed gas system and appliance
29. Use industry standard checks and testing procedures to confirm the integrity of the newly installed or existing chimney system and appliance flue seals
30. Take precautionary actions to prevent the unauthorised use of un-commissioned gas appliances, gas systems, electrical systems and

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components by isolation procedures and use of warning notices

Pre-commission and Commission gas fired ducted air heaters to industry standards and manufacturers instructions

31. Confirm the complete appliance installation complies with the manufacturers' specification, industry standards, Gas Safety (Installation & Use) Regulations, British Standards and Building Regulations

32. Check that conditions within the gas and electricity systems will permit safe commissioning

33. Select and use the correct tools and equipment for commissioning activities

34. Check and confirm:

a) the gas system operating pressures meet industry standards

b) the appliance operating pressure and the gas rate meet industry standards' and manufacturers' requirements

35. Check the combustion performance visually and by flue gas analysis as required

36. Test chimney performance and reconfirm it performs according to manufacturers' and industry standards' requirement's

37. Reconfirm that the ventilation requirements meet industry standards for the installation

38. Check and confirm the operation of the appliance, systems, and components to ensure they function safely and operate in accordance with manufacturers' instructions

39. Instruct the property occupier on the correct operation of the appliance and gas system and provide them with their copy of the appliance literature

Use and communicate data and information to carry out de-commissioning, installation and commissioning work

40. Liaise with the property occupier and other people who will be affected by the work during the planning, de-commissioning, installation, and commissioning processes to minimise disturbance to the job

41. Use normative documents, industry standards, British Standards and information from manufacturers' instructions for the appliance to ensure the work is done to the specification

42. Advise of any delays to the work, unsafe situations and required

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remedial actions to those who require the information

43. Check that the customer is satisfied with the finished job

44. Complete records and documentation confirming the safe commissioning of gas appliances, systems and components

45. Complete gas appliance and system de-commissioning records

46. Submit details of installation and exchange appliance(s) to the Gas Work Notification Scheme

Resolve problems within own area of responsibility and competence which could affect the de-commissioning, installation and commissioning process

47. Rectify problems within own area of responsibility and competence and report deficiencies in gas and electric input services

48. Resolve problems in accordance with approved procedures when:

a) pre-commissioning checks and tests reveal gas appliance, gas system or component defects

b) gas appliances, gas systems and components being commissioned do not meet design requirements

c) when the gas appliance, the gas system or component cannot be restored to full performance

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### Knowledge and understanding

*You need to know and understand:* General Knowledge

1. Regulations and guidance governing health and safety in the workplace, environmental protection and the use of risk assessments
2. Legislation covering the general responsibilities of the operative for their own safety and that of others
3. The limits of your own autonomy and responsibility

De-commissioning, Installing and commissioning warm air central heating

4. The health, safety and environmental factors which need to be incorporated in risk assessment for the domestic installation process
5. Safe access and working at heights
6. The tools and equipment necessary to provide safe access to work at heights, or in confined spaces
7. The methods of working which protect the building décor, customer property and existing systems and components
8. The care and maintenance requirements of tools and equipment, and checks for safe condition
9. The tools, equipment, materials and components required for the gas appliance and gas system de-commission, installation and commission – ordering, supplying, advising, checking and delivery procedures
10. How to safely secure and store tools, equipment, materials and components to minimise loss or wastage
11. The potential hazards that could arise from all de-commissioning, installation and commissioning activities and the checks to be carried out before work takes place
12. The steps to take should materials, components, tools and equipment not be available at the site to commence the de-commissioning, installation and commissioning activity
13. How to access and correctly interpret the required information, including normative documents, industry standards guidance documents, British Standards and manufacturers' instructions applicable to the appliance, to ensure the work is done to the specification and industry standards
14. How to measure and record installation and site details for prefabrication purposes
15. How to confirm that the services and systems are adequate for the installation of the new appliance, system and components, or for extending the system

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16. Safe isolation methods, tests, and procedures to de-commission gas and electricity systems or components
17. The procedures for temporary and permanent de-commissioning of appliances and systems including use of temporary continuity bonds
18. The precautions to ensure that de-commissioned appliances or systems do not prove a safety hazard
19. Measures to prevent de-commissioned appliances or systems being brought into operation utilising safety and warning notices
20. The need to liaise with others whose procedures or routines may be affected by the suspension of the gas appliance and gas system operation
21. The points in the de-commissioning, installation and commissioning process where co-operation and liaison with other trades and property occupier may be required
22. Types of warm air central heating appliances to ensure correct heater selection; downflow, upflow, horizontal flow, & slot-fit
23. The procedures and work methods for sizing warm air central heating appliances
24. The industry practices and work standards for fabricating and installing warm air central heating gas appliances, systems and components to comply with the manufacturers' specification, industry standards, Gas Safety (Installation & Use) Regulations, British Standards and Building Regulations
25. The positioning and fixing requirements for warm air central heating gas appliances, systems and components to comply with the manufacturers' specification, industry standards, Gas Safety (Installation & Use) Regulations, British Standards and Building Regulations
26. The positioning and fixing requirements for warm air central heating appliances, systems and components in; airing cupboards, compartments, roof spaces, slot-fit and under stairs installations in order to comply with the manufacturers' specification and industry standards
27. The industry practices and work standards for fabricating new or existing duct systems for the installation of warm air central heating appliances, systems and components
28. The positioning and fixing requirements for the installation of; warm air ducting, return air ducting, plenums, plenum adaptors, transfer grilles, registers & grilles
29. The industry practices and work standards for connecting to input services including; gas, electric, ventilation and chimney systems,

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including natural & fanned air supply

30. The industry practices and work standards of connecting warm air central heating appliances and components to both new and existing gas, electric, ventilation and chimney systems

31. The industry practices and manufacturers' requirements for the positioning and the installation of condensate drain for condensing warm air units

32. The process and procedures, equipment and legislative requirements for applying tightness testing and purging to appliances, gas systems and components

33. The process and procedures, equipment and legislative requirements for applying electrical tests to appliances, systems and components to ensure safe functioning

34. The routines and sequences for commissioning warm air central heating appliances, gas systems and components in accordance with manufacturers' specification and industry standards

35. The procedures for checking the correct operation and performance of warm air central heating gas appliances, gas systems and components and checking against the design specification

36. The procedures for checking the correct operation and performance of warm air central heating gas appliances, gas systems and components to ensure safe functioning

37. The procedures for checking and confirming:

a) the gas system operating pressures

b) the appliance operating pressure and the gas rate

38. The tests, checks and use of flue gas analysers which confirm the suitability of the gas combustion performance

39. The tests and checks to confirm the integrity, suitability and performance of the systems

40. How to complete all installation and commissioning documentation and records to be left with the property Measures to prevent un-commissioned gas systems being brought into operation utilising safety and warning notices

41. The system handover procedures and demonstrating the operation of warm air central heating gas appliances, gas systems and components to end users

42. The steps to take when problems arise in the work activities

43. Job management structures and methods of reporting and recording job progress or problems delaying progress

44. How to safely collect and dispose of system contents that may be hazardous to health or the environments



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45. How to isolate unsafe gas appliances, gas systems and components and application of the gas industry unsafe situations procedure

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### Glossary

“Cookers” refers to Freestanding, Built In, Slide Under, Hotplates, Grilles, Range Cookers, and Dual Fuel Cookers

“Leisure Appliances” refers to Greenhouse Heaters, BBQ’s, Patio Heaters, Gas Flambeaux, and Outdoor Gas Lighting

“Gas fired ducted air heaters” refers to Basic Warm Air Units and Combined Warm Air Units – these incorporate a Gas Circulator Storage Water Heater. They may be configured as Down-flow, Up-flow, Horizontal-flow and Slot-fit and will include Open, Room-Sealed, and Fan Draught Chimneys

“Work Site” refers to the area where the work will take place and all areas affected by the works

‘Services and Systems’ refers to water, central heating, gas, electricity supply, condensate disposal, chimneys, ducting and ventilation systems

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