

## Maintain gas fired ducted air heaters and appliances

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### Overview

This national occupational standard is for gas engineers who are required to maintain 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, maintaining, de-commissioning and commissioning those appliances.

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### Performance criteria

- You must be able to:*
- Plan and prepare work activities for maintaining gas fired ducted air heaters
  1. Identify, record and agree the customer's job requirements in line with statutory requirements
  2. 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
  3. 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
  4. Protect the work site and the building fabric against possible damage being caused during the de-commissioning and maintenance process
  5. Check and confirm all materials, tools and equipment necessary for the de-commissioning, maintenance and commissioning process are available as required and are fit for purpose
  6. Check and confirm that the siting of the appliance meets the manufacturers' and industry standards' requirements for location, siting and clearances
  7. Check the existing duct system of the appliance to ensure it meets manufacturers' and industry standards' requirements
  8. Confirm that the gas supply, electricity supply, the chimney suitability and the provision of ventilation meet the appliance manufacturers' and industry standards' requirements for the installation
  9. Carry out all necessary checks and tests to confirm the gas supply, electricity supply, the chimney system and the existing warm air and return air ducts meet the manufacturers' and industry requirements for the installation
  10. Check location of condensate disposal is in compliance with appliance manufacturers' and industry standards' requirements, as necessary
  11. 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 and manufacturers instructions
12. Check that conditions within the gas and electricity systems will permit safe de-commissioning

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

Maintain gas fired ducted air heaters to industry standards and manufacturers instructions

17. Carry out preparatory work to meet the maintenance requirements set out in the plan
18. Remove existing gas and electricity system components as required by the planned maintenance activities
19. Carry out the maintenance process in accordance with manufacturers' specification and industry standards, taking care to minimise damage
20. Select and use the correct tools and equipment for maintenance work activities
21. Re-position the appliance and confirm it meets the location, siting and clearances required by the manufacturers' and industry standards' specification
22. Confirm existing ventilation for appliances and system meets industry requirements for the installation
23. Ensure existing gas systems are clean and free of debris
24. Re-connect gas and electricity system components to the appliance
25. Use tightness testing and purging procedures and electrical testing to confirm the integrity of the re-connected and re-installed system and appliance
26. Use industry standard checks and testing procedures to confirm the integrity of the existing chimney system and appliance flue seals

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

27. Confirm the complete appliance installation complies with the

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manufacturers' specification, industry standards, Gas Safety (Installation & Use) Regulations, British Standards and Building Regulations

28. Check that conditions within the gas and electricity systems will permit safe commissioning
29. Select and use the correct tools and equipment for commissioning activities
30. 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
31. Check the combustion performance visually and by flue gas analysis as required
32. Test chimney performance and reconfirm it performs according to manufacturers' and industry standards' requirements
33. Reconfirm that the ventilation requirements meet industry standards for the installation
34. Reconfirm that the location of condensate disposal is in compliance with appliance manufacturers' and industry standards' requirements, as necessary
35. Check and confirm the operation of the gas appliance, the systems and components to ensure they function safely and operate in accordance with manufacturers' instructions
36. Instruct the property occupier on the correct operation of the appliance and gas system and provide them with their copy of the appliance literature
37. Take precautionary actions to prevent the unauthorised use of un-commissioned gas appliances, gas systems, electrical systems and components by isolation procedures and use of warning notices

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

38. Liaise with the property occupier and other people who will be affected by the work during the planning, de-commissioning, maintenance, and re-commissioning processes to minimise disturbance to the job
39. Use normative documents, industry standards, British Standards and information from manufacturers' instructions for the appliance to ensure the work is done to the specification
40. Advise of any delays to the work, unsafe situations and required remedial actions to those who require the information

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- 41. Check that the customer is satisfied with the finished job
- 42. Complete records and documentation confirming the safe maintenance of gas appliances, systems and
- 43. Complete gas appliance and gas system commissioning and de-commissioning records as required and ensure they are stored securely

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

- 44. Rectify problems within own area of responsibility and competence and report deficiencies in gas and electric input services
- 45. Resolve problems in accordance with approved procedures when:
  - a) pre-maintenance 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) 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, maintaining and commissioning warm air central heating

4. The health, safety and environmental factors which need to be incorporated in risk assessment for the domestic maintenance 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, maintenance 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, maintenance 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, maintenance 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 confirm that the gas supply, electric supply, chimney system and ventilation requirements are adequate for existing gas appliances, systems, or components

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15. How to confirm that the existing duct system is adequate for the warm air central heating appliance, system and components
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, maintenance and re-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 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
24. 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
25. 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' and industry standards' requirements
26. The positioning and fixing requirements for the installation of; warm air ducting, return air ducting, plenums, plenum adaptors, transfer grilles, registers & grilles
27. The industry practices and work standards for connecting to input services including; gas, electric, ventilation and chimney systems, including natural & fanned air supply
28. The industry practices and work standards for connecting warm air central heating gas appliances and components to both new and

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existing gas, electric, ventilation and chimney systems

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

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

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

32. The routines and sequences of the maintenance process of warm air central heating domestic gas appliances, gas systems and components in accordance with manufacturers' specification and industry standards

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

34. 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

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

36. The procedures for checking and confirming

a) the gas system operating pressures

b) the appliance operating pressure and the gas rate

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

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

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

40. The system handover procedures and demonstrating the operation of replacement systems and components to end users

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

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

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



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44. 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 and ventilation systems

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