Heating and hot water

Covered in this section:
- Heating system classification
- Fuel choice
- Heating controls
- Water heating
- Flue gas heat recovery systems and waste water heat recovery systems
Heating and hot water

- Most time consuming section!
- RdSAP allows up to three different heating: main1, main 2 and secondary space systems to be specified.
- Boilers are the most troublesome to accurately identify as you need the fuel type, age and features as a bare minimum.
- Heating controls must also be recorded.
- Only one type of water heating system can be selected.

Each of the above items must match a category on the RdSAP heating list.

Categorizing the heating system

In some cases it may not be immediately clear which of a number of systems present should be classified as the main system(s) and which as the secondary.

First identify the main system, if more than one use main 2 for a second main system or for a hot water only boiler. Main 1 is the system that serves the main living area. Refer to SAP Appendix A for more detail.

RdSAP Convention 4.09 – Two main systems
There is an option for two main systems to cover the situation of different systems heating different parts of the dwelling.
If main system 1 heats all habitable rooms, there is no main system 2 unless it serves DHW only (see Convention 6.04).
Main systems 1 and 2 cannot be room heaters except in the case of the dwelling’s heating consisting solely of room heaters.
A main system is generally one that would be described as central heating (a heat generator providing heat to several rooms via a heat distribution system), although the term does also include for example storage heaters and fixed direct-acting heaters in each room.
When there are two main systems, system 1 always heats the living area and:
- where two systems serve different spaces, the percentage recorded for each system is in proportion to the heated floor area served by each system;
- where two systems serve the same heating circuit the default assumption should be a 50/50 split. A different ratio can only be used if there is clear documentary evidence to back this up.
When there are two main systems and a recommendation is made for heating system upgrade, include Addendum 9.
A second main system is not to be confused with a secondary heater. The latter are room heater(s) heating individual room(s) either as a supplement to the main heating in the room (e.g. a wood burning stove in the main room) or for rooms not heated by the main system(s). See Conventions 5.01 to 5.03 for rules on secondary heaters.
If there is more than one main system within a room, select one of them according to the rules in SAP Appendix A and disregard the other.
Integrated storage/direct acting in living area, normal storage heating elsewhere: treat as two main systems.
Any remaining systems can still be input as a secondary system but it needs to be input as a room heater. A room heater system should be chosen so that its efficiency closely reflects (but does not exceed) that of the actual system (as defined by the heating tables in the full version of SAP). The chosen room heater should also use the same fuel/tariff as the actual system.

If two types of secondary heater are present, that which heats the greater number of rooms should be specified as the secondary system (and the other secondary heaters disregarded). If that condition does not resolve the choice, the system which is the cheapest to use should be specified.

*The decision to include a secondary heating system should be based on the characteristics of the dwelling and the systems installed and not on the heating practices of the occupying household.*

To summarise:

<table>
<thead>
<tr>
<th>The main heating system</th>
<th>The secondary heating system</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Heats a large proportion of the dwelling</td>
<td>• Is always based on room heaters</td>
</tr>
<tr>
<td>• Is not usually based on individual room heaters</td>
<td>• Is based on the characteristics of the dwelling, not the occupancy habits</td>
</tr>
<tr>
<td>• Often provides hot water as well as space heating</td>
<td>• Direct acting electric heaters are assumed as the secondary heating system for any unheated habitable rooms.</td>
</tr>
<tr>
<td>• Is generally the cheapest to run</td>
<td></td>
</tr>
</tbody>
</table>

For situations where there is no fixed heating in a property, the option ‘no space heating system’ (code 699) should be entered. The software will assume on-peak portable electric room heaters as the main system when this is selected.

If a permanently fixed room heater is present it should be included as secondary heating regardless of whether “central heating” heats all rooms.

If more than one secondary heater:

(a) select the device that heats greatest number of habitable rooms;
(b) if that does not resolve it, select the device using the cheapest fuel;
(c) if that does not resolve it, select the device with the lowest efficiency.

Electric focal point fires are included even if not wired by a fixed spur.

Leave blank if no form of fixed secondary heating is present.

See SAP Appendix A for more details on selecting Main and Secondary heating.

*Note:*

If no heating system is present, as of SAP2005 v9.82 there is now an option to select ‘no heating system’ (Code 699). In these cases portable electric heater with no controls are assumed.
Electricity tariffs

- ‘Single’, ‘Dual’, ‘Dual 24-hour’ or ‘Unknown’
- Generally easy to identify a dual rate meter – ‘low’ and ‘normal’ readings and (usually) by the presence of storage heating
- Dual 24-hour can also be selected, but this only available in Scotland and to some properties supplied by Scottish Power in Northumbria
- Other special tariffs e.g. heat pump or white meter should simply be recorded as ‘dual’
- Pre-paid meters are not differentiated within the survey (but can be important for giving energy advice)

Fuel type

Mains gas pretty easy to spot from presence of a meter or appliances, but...

| Oil tank | Underground LPG cylinder | LPG Cylinder | Bottled Gas |

Be sure that you don’t miss the presence of LPG or oil which are especially common in rural situations. It is VERY important that the correct type of fuel is recorded as the impact on the SAP rating is enormous.

RdSAP 2009 introduced an addition fuel source equivalent to mains gas: LPG subject to Special Condition 18. This effectively allows LPG to be charged at mains gas prices for connected dwellings in four designated areas: Stornaway, Llanwrttyd Wells, Llanfyllin and Corden.

**RdSAP Convention 4.11 – LPG subject to special condition 18**

Applies only if documentary evidence confirms that the property receives LPG at mains gas prices.
Biodiesel, Bioethanol and B30K oils have also been added to the fuel list.

**RdSAP Convention 4.10 – Liquid biofuels**
Used only for appliances selected from the database.

<table>
<thead>
<tr>
<th>Anthracite nuts or grains.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be used in stoves and boilers and will be found in smoke control areas. It can be found in a number of sized “nuts” and “grains”. The “grains” are used in auto feed boilers.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>House coal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be used in stoves and fires but won’t be used in smoke control areas.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Manufactured smokeless fuels e.g. Coalite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be used in stoves/ fires and some boilers - will be used in smoke control areas. Smokeless fuel will be reformed in a variety of sizes. It will probably only be found in a smoke control zone because it is more expensive than coal.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wood, wood-chip, pellets, logs or coppice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Look for evidence of use of wood. Piles in the garden/shed/garage. This fuel could be in the form of wood-chip, reformed pellets, logs or coppice.</td>
</tr>
</tbody>
</table>

SAP Table 12b provides indicative list of which fuels are used with which appliances.

If a heating appliance can only burn on fuel, then record that fuel (includes exempted appliances burning wood in smoke control areas). Otherwise:

- In a smoke control area:
  - Open fire, select ‘smokeless’
  - Closed heater, select ‘anthracite’

- Not in a smoke control area:
  - Open fire, select ‘dual fuel’
  - Closed heater, select ‘wood logs’ if capable otherwise ‘anthracite’.

**Mains gas available**

The DEA also need to determine if ‘mains gas’ is available within the dwelling. This is a simple yes/no answer, but influences the potential recommendations for heating upgrades and possible fuel switch.

**RdSAP Convention 8.02 – Mains gas available**

Only if gas meter or gas burning appliance (e.g. gas cooker) is within the property. A closed-off gas pipe does not count.

Where a boiler is present attached to a heating system (not in a box), and the mains gas meter has been removed for security reasons, enter a gas boiler as the main form of heating and indicate that mains gas is present.
Boilers

You should record the brand name, model and model number in addition to its generic type (and associated code).

For example:

<table>
<thead>
<tr>
<th>Heating and Controls:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Database Ref No</strong></td>
</tr>
<tr>
<td><strong>General description of heating</strong></td>
</tr>
<tr>
<td>Regular, wall mounted, non-condensing gas boiler, fan assisted flue, automatic ignition, post-98</td>
</tr>
<tr>
<td><strong>Boiler Manufacturer</strong></td>
</tr>
<tr>
<td>Potteron</td>
</tr>
<tr>
<td><strong>Boiler Model</strong></td>
</tr>
<tr>
<td>Profile</td>
</tr>
<tr>
<td><strong>Boiler ID</strong></td>
</tr>
<tr>
<td>100e</td>
</tr>
<tr>
<td><strong>Main heating</strong></td>
</tr>
<tr>
<td><strong>Code</strong></td>
</tr>
<tr>
<td>101</td>
</tr>
<tr>
<td><strong>Non-condensing post-98 regular gas boiler</strong></td>
</tr>
<tr>
<td><strong>Fuel</strong></td>
</tr>
<tr>
<td><strong>Code</strong></td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td><strong>Mains Gas</strong></td>
</tr>
</tbody>
</table>

The preferred source of boiler efficiency is the government’s Boiler Efficiency Database, which contains boiler efficiency figures intended for use in SAP.

Note:

- You should attempt to enter gas, LPG or oil room heaters with a back boiler via the boiler efficiency database
- You cannot enter solid fuel boilers via the boiler efficiency database

1. The government’s boiler efficiency database

Can be accessed via [www.boilers.org.uk](http://www.boilers.org.uk), with this database also being integrated directly by the RdSAP software:

- Incorrect boiler identification could make a very big difference to the accuracy of your rating (up to 10 SAP points) – so don’t guess or select a close approximation!
- Most other (old/obsolete) boilers have estimated values from SAP Table 4b.
- Boiler ID may sometimes be located on the top of the boiler
BOILER DATABASE TIP

Can’t find a particular boiler – try some of these....

Ideal boilers - Caradon Plumbing Ltd (also known as Caradon Ideal ltd)
Potterton Myson Ltd has several names under which it originally traded before being taken over by Baxi Heating Ltd e.g. Potterton International Ltd, Potterton Myson Heating, Myson Combustion Products Ltd
Bosch – can be found under Worcester Heat Systems
Burco Dean Appliances Limited can be found under Maxol
Centurion boilers can be found under Boulter Boilers Ltd
Claudio boilers can be found under Vokera Ltd
Wickes combi boilers can be found under Halstead Boilers Ltd
Saunier Duval boilers can be found under Hepworth Heating Ltd
Trisave boilers can be found under Crosslee plc


2. Generic boiler type

For a boiler you must record the following information on the survey form:

• Fuel
• Date of manufacture
• Flue type
• Non-condensing or condensing
• Regular or combi
• Automatic ignition or permanent pilot light
• Floor, wall or back boiler

Above all you must match a generic boiler category on the RdSAP heating list.

RdSAP Convention 4.03 – Boiler missing or not working
If boiler/heating system is present but not working (or condemned) it should still be entered as the main heating system.
If boiler not present but intended – enter no heating system.
Identifying boilers

Combi boiler

- More pipes entering the boiler (5 or 6 instead of 3)
- The boiler firing when the hot water is turned on
- No hot water cylinder
- A pressure gauge
- Heating and hot water controls on the front panel

Condensing boiler (either regular or combi)

Must have both of the following features present:

- Fanned flue – plumbing will be visible in cold weather
- Plastic condensate pipe to main drain (usually white as above)

Boiler age?
The date refers to the year of manufacture of the boiler. If this is uncertain the older category should be used.

- Styling clues
- Pilot light not very common post-98.
- Manufacturers label
- Presence of Energy Efficiency Recommended logo (generally indicates post-98)
- Ask the occupant

Notes:

**Boilers 1998 or later**

If the ignition type is not known, a boiler with a fan-assisted flue may be assumed to have automatic ignition, and one with an open flue to have a permanent pilot light. A piezo electric switch will be required on any boiler which has a permanent pilot light in case it needs re-lighting.

**Heat emitters**

Identify from either: Radiators, Underfloor or Fan coil (for heat pumps only).

<table>
<thead>
<tr>
<th>RdSAP Convention 4.01 – Heat emitters</th>
</tr>
</thead>
<tbody>
<tr>
<td>If one heating system feeds both underfloor and radiators, enter radiators.</td>
</tr>
<tr>
<td>This is because if radiators are present there has to be a higher flow temperature.</td>
</tr>
</tbody>
</table>

**Boiler missing or not working**

If boiler/heating system is present but not working (or condemned) it should still be entered as the main heating system.

If boiler is not present – enter code 699 'no heating system'.

**Micro-CHP**

This type of heating system is now partially modelled in RdSAP – if a Micro-CHP system is located in the boiler database this must be entered, otherwise it should be recorded as a condensing boiler and Addendum 5 added.

<table>
<thead>
<tr>
<th>RdSAP Convention 4.04 – Micro-CHP</th>
</tr>
</thead>
<tbody>
<tr>
<td>If micro-CHP and the system cannot be found in the database, enter as condensing boiler and include Addendum 5.</td>
</tr>
</tbody>
</table>

**Addendum 5**

The DEA must ensure that the following addendum is selected in RdSAP software so the EPC produced will clearly state how the Micro-CHP unit has been modelled:

**5. Dwelling has micro-CHP.**

“The performance of the micro-CHP system in this dwelling are not known and default values were used for the assessment.”
**Flues and chimneys**

Applies to boilers and warm-air systems. For fires and room heaters use normal flue type indicated in their description (see Table 4a of SAP or heating system code list)

<table>
<thead>
<tr>
<th>Balanced flue</th>
<th>Fan assisted flue</th>
<th>Fan assisted flue</th>
<th>Pre-fabricated open flue (either lining the chimney or on outside wall)</th>
<th>Ridge flue (A form of open flue)</th>
</tr>
</thead>
</table>

**Conventional brick-built chimney** - combustion products rise through convection and are also drawn up by wind passing the top of the chimney, creating an updraught. These are built in to the original design of the house. - Class 1 Flue

**Pre-cast concrete flue** - common in newer homes, these are built into the original walls - without increasing their thickness. - Class 2 Flue

**Prefabricated flue** - usually a later addition, this is a twin-skinned flue (made from stainless steel) which is attached to the inside of a wall and led away either through the roof or through an outside wall. These are sometimes boarded over to imitate a chimney breast - Class 2 Flue if less than 152 mm.

Balanced flues are always found on an outside wall - giving the shortest and safest route to disperse the products of combustion.

**Note:**

The term 'room-sealed' means it is not an open flue. Open flues are like chimneys in many respects – they draw air from within the house (hence requiring an air brick in the room in which they are present) and have quite large diameters. They are not fanned. The terms 'room-sealed', 'fan assisted' and 'balanced' all imply that a flue type is not 'open'.
Combined Primary Storage Units (CPSU)

- Contains a >70* litre hot water store within the boiler casing which feeds both space heating and hot water
- The thermal store is heated directly
- Floor standing
- Larger casing
- Gas or electric

<table>
<thead>
<tr>
<th>Gas CPSU (note flue, which can be balanced or open flue)</th>
<th>Electric CPSU (no flue)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code 120 non-condensing</td>
<td>Code 192 (off-peak only)</td>
</tr>
</tbody>
</table>

Three criteria must be fulfilled for a boiler to qualify as a CPSU. These are as follows:

- The store and boiler must be in the same casing.
- The store must have a capacity of at least 70* litres (if the store is less than this it should be treated as a storage combi).
- The space heating circuit feed must be taken directly from the store (while in the case of a storage combi, the store does not feed the space heating circuit).
**Back boilers**

There will be evidence of a heat distribution system, radiators or underfloor heating, but no obvious signs of a standalone boiler.

- Can be either closed or open
- Fuel can be gas, oil or solid
- Check for water pipes around the appliance
- There will be evidence of a heat distribution system but no obvious signs of a standalone boiler
- Note the brand name, model and model number – it could be in the boiler efficiency database
- Where the back boiler provides hot water only – enter as Main 2 or secondary heating
- If the back boiler is fuelled by gas – select back boiler as the primary heating system type (code 109 or 119) and record the gas fire in-front of the back boiler as the secondary heating system (e.g. code 601, 603, 605 or 607)
- For oil (code 131 or 132) and solid fuel (code 156, 158 or 159) back boilers – record these as the primary heating system as appropriate, but do not record the fire/stove in front of the unit as a secondary heating system (however if there is another secondary heating system elsewhere do record it)

Select the relevant codes:
- Gas use: 109 or 119
- Oil use: 131 or 132
- Solid fuel: 156, 158 or 159.

Back boilers with no radiators provide hot water only – should be entered either as Main heating system 2 (with 0% heating fraction) or as Secondary heating. Only enter codes 602, 604, 606, 622, 624, 632, 634 or 636 as Main heating system 1 if located in the “main living area” and there is no other system serving this room.

If fuelled by gas, it may be possible to enter via the boiler efficiency database etc... (i.e. same procedure as with boilers) – solid fuel boilers must be entered according to their generic type. Record the brand name, model and ID.

Good practice for recording a solid fuel heating system would be:

> “Inset rectangular grate open fire with back boiler to rads”

HETAS has lots of useful information and efficiencies of some appliance types.
Note

When recording a room heater with a back boiler (to radiators) as Main heating, you must also consider if you need to enter the fire/stove to the front as a Secondary heating system.

The following rules apply:

1. If a boiler is selected and the fuel is gas (heating code 109 or 119), then the room heater to the front must be additionally recorded as Secondary heating.

2. If a boiler is selected and the fuel is not gas, then no form of Secondary heating is recorded, unless another form is present.

3. If a fire/stove (any fuel) with back boiler (no radiators) is selected (this means the boiler provides DHW only, not heat to radiators), then the fire/stove in front does not need to be additionally recorded as Secondary.

The rules for selecting Secondary heating systems still apply, so if there is another form of Secondary heating that heats a greater number of habitable rooms then that should be recorded instead. See Appendix A.
Stand-alone boilers

Solid fuel

- Run on anthracite nuts or grains only
- Open flue or chimney
- Supply heat and hot water (vented)
- Manual (or batch) feed boilers require regular refuelling approximately every 10hrs
- Auto feed (or gravity) boilers include a hopper on the top of the boiler – these can supply heat for up to 36hrs without refuelling or de-ashing
- Forced draught fan is sometimes used to boost heat output
- Within heated space: code 151 or 153
- In unheated space: code 152 or 154

These can provide full central heating for most dwellings and are available in a wide range of outputs and sizes. Batch fed units will provide domestic hot water and sufficient heat for a three to four bedroom house. Gravity fed boilers (which have a large hopper over the fire box) will operate for up to 36 hours at minimum output and for 10 hours on full burn rate without refuelling or de-ashing. All of them burn small anthracite nuts or grains which are feed into the fire as necessary. Combustion is assisted by a built-in thermostatically controlled fan, which helps adjust output to demand.

Gravity-fed units have a high turn down (around 10:1), which means that they can kindle at low combustion rates, compared with other solid fuel appliances. There is still some background heat given off when the boiler is turned down to minimum, helping to prevent condensation within the dwelling.

Wood chip and pellet

Modelled using similar systems as solid fuel boiler, but record the fuel type as wood chips or pellets (code 155).

- Run on wood chip or pellets only
- Open flue or chimney
- Supply heat and hot water (vented)
- Always auto-feed via a hopper
- Forced draught fan is sometimes used to boost heat output

Please read EST’s Energy Efficiency Best Practice in Housing guide: Domestic heating by solid fuel: boiler systems (CE47) available from www.energysavingtrust.org.uk
Electric direct acting boilers

- Compact size
- No flue or fuel storage required
- Only two pipes – feed pipe is located on the top, return on the bottom
- Used in similar arrangement as a normal boiler

Code 191

e.g. Heatrae Sadia Electroheat Range (Amptec), Trianco Aztec Electric Boilers or Redring dualheat.

Electric storage boilers

- Wet and dry core varieties
- Provide heating and hot water
- Economy 7 tariff (if run on on-peak then it’s a direct acting electric boiler - 191)
- Controlled by room thermostat and TRVs only
- GEC ‘nightstor’ is a dry core off-peak boiler
- Extremely rare!

Codes 193 or 195.

During all off-peak periods, the boiler automatically engages recharge mode. Some or all of the upper heaters (according to boiler specification) are turned on as is the lower heater if present. Additionally, the primary pump is operated from time to time during recharge; this cycles water through the boiler to ensure that it is all thoroughly recharged. The heaters turn off automatically when the whole boiler reaches the full recharge temperature.

If further heat is used during the off-peak period, the heaters will come on again as necessary to maintain full charge. On some models, the recharge temperature is near boiling point, and will be higher than the boost temperature.
Range cookers

Range cookers are flued cooking appliances predominantly constructed of cast iron designed to provide some heat from their case into the space in which they are located.

- Can be run on gas (codes 133, 134 or 136), oil (codes 139 & 140) or solid fuels (code 160) – check if in the boiler database first
- Normally open flued (sometimes also includes a balanced flue if an internal boiler is present)
- Ranges, such as AGAs, which supply hot water only are sometimes interconnected into a gravity fed hot water supply to supplement a boiler or other heat source
- Twin burner models contain an integral boiler fuelled by mains gas, LPG or oil which supply central heating to the dwelling - these should be modelled according to the same procedure as a boiler (i.e. preferably via the boiler efficiency database)
- Single burner models should be entered as a generic system

Do not include in RdSAP calculations if the range only serves as a cooker!

Range cooker with boiler for space heating

This type provides an independent water heating function for space heating in addition to the cooking function. There are two design variations:

- Twin burner range cooker/boiler – an appliance with two independently controlled burners, one for the cooking function, one for the water heating function for space and/or water heating.

  For the twin burner type, the efficiency can be from the boiler efficiency database, manufacturer’s declaration or the generic efficiency if it cannot be found.

- Single burner range cooker/boiler – an appliance with a single burner that provides a cooking function and a water heating function for space and/or water heating.

  For the single burner type, a generic type and efficiency should be used.
Hot water supply is sometimes mated with a special ‘twin coil’ hot water cylinder to make use of the hot water feed – the twin coil cylinder will include an immersion heater which is used when the range is not running – disregard the immersion element as you would for any cylinder linked to a main heating system/boiler. Select the relevant hot water code for the specific fuel type (924, 928 or 930).

For single burner ranges (without an integral space heating boiler), disregard for heating purposes and select the relevant hot water code for the specific fuel type (921, 922, 927 or 931).

Note:

An AGA does not supply central heating output, but a Rayburn can – for example their heatranger models.
Warm air

Gas & oil

- Gas/oil is burned to heat up hot water in a heat exchanger
- Air is drawn over this by a fan and ducted into each room (ducted or stub-ducted)
- Usually includes a built in hot water circulator which feeds an external cylinder
- You must record:
  - Age
  - Non-condensing or condensing
  - Presence of any flue heat recovery

Electric

- Such as Dimplex “electricaire”
- Similar principle as gas or oil warm air, except the central core is heated using off-peak electricity overnight
- Control panel contains a charge input (similar to storage heaters), a fan setting (normal or boost)
- Sometimes additional room thermostat is fitted to provide additional control
- Hot water will be supplied by a separate system
- Must be supplied by a dual tariff meter, if on a single meter then record as on-peak electric panel heaters.

Code 515.
**Storage heaters**

Storage heaters are usually more economical than direct acting electric heaters – a high density thermal block containing electric elements is charged overnight using cheap off-peak electricity. Charge and output controls in addition to a flap or damper moderate the amount of heat given out.

**Important**

Electric storage heaters can only be recorded as a main heating system.

Storage heaters must be supplied by a dual tariff meter, if storage heaters are present but on a single meter then record as on-peak electric panel heaters and include *Addendum 6*.

If electric storage heaters or off-peak electric underfloor heating is the main system (codes 401, 402, 404 or 421) and no fixed secondary heater has been identified, a secondary system of portable electric heaters (formerly code 693) is automatically included by the software. (There is no longer a requirement for the assessor to specify this.)

<table>
<thead>
<tr>
<th>Old large volume</th>
<th>Modern slimline</th>
<th>Fan assisted storage heaters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulky, 9 to 12” deep</td>
<td>6” or less deep</td>
<td>Blows air over storage heater – more responsive &amp; improved distribution of heat</td>
</tr>
<tr>
<td>Normally free standing</td>
<td>Wall mounted, but will have legs/feet</td>
<td></td>
</tr>
</tbody>
</table>
Integrated storage/direct acting (duo) heaters

- Modern storage heaters incorporate a direct acting on-peak electric heating element to the front

Code 408.

Integrated storage/direct acting heaters (code 408) can be similar in appearance to other modern storage heaters, but they incorporate a direct acting on-peak electric heating element to provide boost heating when the thermal block has run out of heat or the occupant wishes to have a quick boost of heat.

RdSAP Convention 4.02 – Storage heaters

If storage heaters are present as main heating but single meter – enter as panel heaters and include Addendum 6. If the storage heaters are fan-assisted suppress the recommendation for fan-assisted storage heaters.

Addendum 6

The DEA must ensure that the following addendum is selected in RdSAP software so the EPC produced will clearly state how a storage heater or dual immersion has been modelled if run on a single tariff electric meter:

6. Off-peak appliance(s) with single meter.

“A dual rate appliance(s) is present with a single-rate supply. A single-rate appliance has been used for the assessment. Changing the electricity tariff to an off-peak (dual rate) supply is likely to reduce fuel costs and improve the energy rating.”

Electric underfloor or ceiling heating

- Often used in extensions and living rooms (because of its aesthetic & space saving features)
- Unusual for it to be employed to heat the whole dwelling, the main heating will normally be storage heaters
- Record control type
- Integrated storage/direct acting underfloor heating will have an off-peak and on-peak connection (422).
- Older systems will have a numbered dial in the lounge (which doesn’t display temperature)
- If secondary system record as a direct acting electric panel heater

Underfloor – codes 421, 422 or 424

Ceiling heating – code 701.
Heat pumps

- There are a variety of heat pump systems, the most common being ground source or air source
- Ground source heat pumps use a long loop of pipe buried in the ground to extract low temperature heat
- The heat extracted is then brought up to the demand temperature using electricity before being circulated around the distribution system, normally underfloor, but sometimes warm air
- Some heat pumps also require supplementary on-peak direct electric heating (record as 'with auxiliary heater')
- Air source heat pumps take heat from the external air
- Any fixed direct acting on-peak heaters should also be recorded as secondary heating on the survey form

A heat pump is a device which takes heat energy from a low temperature source and upgrades it to a higher temperature at which it can be usefully employed for heating. There are a number of heat pump techniques by which this can be achieved. The ratio of heat energy released to the energy consumed can be significantly greater than one. Heat pump systems operate most efficiently when the source temperature is as high as possible and the heat distribution temperature is as low as possible.

The figures used in the SAP calculation apply to electrically driven, vapour compression heat pumps. Heat pump systems are categorised by the low temperature heat source used (e.g. air, water or ground) and the seasonal performance factors given in SAP2009 Table 4a are assumed to apply for all systems using that source.

This is a simplified approach especially for ground source heat pumps where energy may be collected from the ground in a variety of ways, e.g. using surface water from lakes or ponds, using ground water from wells, using fluid (either refrigerant or a water/antifreeze mixture) circulated in closed pipe loops buried horizontally in shallow trenches or vertically in boreholes.
Community heating

Any heating (or hot water) system that serves more than one self-contained dwelling must be entered as ‘community’ heating. See RdSAP Convention 4.05.

For purposes of RdSAP community heating systems are defined according to the fuel burnt, source of fuel and whether or not power is also generated
- If the fuel type cannot be determined use ‘mains gas’

There are three options:
- Heat produced by boilers only (301)
- Combined heat and power (CHP) units (302)
- Community heat pump (304)

For community heating schemes, the DEA only needs to record the fuel used to run the centralised community heating boilers, from the current options:
- 51 Mains gas
- 54 LPG
- 53 Oil
- 55 B30D
- 54 Coal
- 41 Electricity (heat from electric heat pump)
- 42 Waste combustion
- 43 Biomass
- 44 Biogas (landfill or sewage gas)

It is recommended that the DEA contacts the supply company to identify the fuel type as this can be difficult to determine through the survey. If the fuel type cannot be determined, mains gas should be assumed. See RdSAP Convention 4.06.

’Flat rate charging’ means that households pay for the heat according to a fixed monthly or annual amount, not depending on the amount of heat actually used. If the charges vary within a scheme for other reasons, for example according to dwelling size, it is still classified as flat rate. The last entry refers to a system in which the charges are substantially related to the amount of heat used.

Shared or Group heating schemes

All of the following are now considered ‘community’ heating:
- Where a more than one separate dwelling, and some communal areas, share the use of one boiler.
- Where a separate dwellings shares a boiler with any non-domestic space (e.g. shops or offices).

Common in old peoples homes and sheltered housing.
For any number of separate dwellings sharing the same heating system, a separate EPC will be required for each self-contained dwelling for a single household.
Room heaters

Fixed gas, solid fuel, oil or electric room heaters can be recorded as main or secondary heating (see RdSAP Convention 5.01):

Gas room heaters

Are primarily categorised according to the flue type:

<table>
<thead>
<tr>
<th>Open flue</th>
<th>Balanced flue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas fire, open flue, pre-1980 (open fronted)</td>
<td>Wall mounted gas heater or open fronted heaters with balanced flues are common</td>
</tr>
<tr>
<td>Code: <strong>601</strong> or <strong>602</strong> if it incorporates a back boiler (doesn’t feed radiators just provides hot water)</td>
<td>Modern gas fire room heaters often have balanced flues and closed fronts to increase efficiency.</td>
</tr>
<tr>
<td>Gas fire, open flue, post-1980 (open fronted) sitting proud of and sealed to the fireplace opening (i.e. self contained unit)</td>
<td>Condensing</td>
</tr>
<tr>
<td>Code: <strong>603</strong> or <strong>604</strong> if it incorporates a back boiler (doesn’t feed radiators just provides hot water)</td>
<td>Condensing room heaters will have a condensate pipe and fanned flue (all fanned flues are balanced).</td>
</tr>
<tr>
<td>Gas flush fitting live fuel effect fire (open fronted), sealed to fireplace opening with open or balanced flue (as shown above).</td>
<td>Code: <strong>605</strong> or <strong>606</strong> if it incorporates a back boiler (doesn’t feed radiators just provides hot water)</td>
</tr>
<tr>
<td>For a fanned flued model: Code: <strong>607</strong></td>
<td></td>
</tr>
</tbody>
</table>

BRE Training
### Solid fuel room heaters

Are also categorised according to flue type (see **RdSAP Convention 5.03**):

<table>
<thead>
<tr>
<th>Chimney</th>
<th>Flueless</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decorative open fire in grate, Code: 631</td>
<td>Open fire with back boiler, Code: 632</td>
</tr>
<tr>
<td>Refer to <strong>RdSAP Conventions 5.02</strong></td>
<td>Closed room heater without a back boiler, Code: 633</td>
</tr>
<tr>
<td></td>
<td>Stove – pellet fired, Code: 635</td>
</tr>
<tr>
<td></td>
<td>Closed room heater with back boiler (no radiators), Code: 634</td>
</tr>
<tr>
<td></td>
<td>Stove – pellet fired with back boiler (no radiators), Code: 636</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Oil pre-2000</th>
<th>Oil 2000 plus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil room heater, Code: 621</td>
<td>Oil room heater, Code: 623</td>
</tr>
<tr>
<td>With back boiler (no radiators), Code: 622</td>
<td>With back boiler (no radiators), Code: 624</td>
</tr>
<tr>
<td>Bioethanol heater (secondary only), Code: 625</td>
<td></td>
</tr>
</tbody>
</table>

If a heating appliance can only burn one fuel, then record that fuel (includes exempted appliances burning wood in smoke control areas).

Otherwise apply **RdSAP Convention 5.03**:

- In a smoke control area:
  - Open fire, select ‘smokeless’
  - Closed heater, select ‘anthracite’
- Not in a smoke control area:
  - Open fire, select ‘dual fuel’
  - Closed heater, select ‘wood logs’ if capable otherwise ‘anthracite’.
Direct acting electric room heaters

Two categories may be selected:

<table>
<thead>
<tr>
<th>Panel, convector or radiant heaters</th>
<th>Portable heaters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code: 691</td>
<td>(former Code: 693)</td>
</tr>
<tr>
<td>Wall mounted radiant heaters:</td>
<td>Examples:</td>
</tr>
<tr>
<td>Wall mounted panel heater:</td>
<td></td>
</tr>
<tr>
<td>Electric fires:</td>
<td>Portable fan heaters or electric radiators should never be recorded.</td>
</tr>
<tr>
<td>Electric kick space heaters:</td>
<td>If there is a primary heat system present and no other form of fixed secondary heating then portable electric heaters should not be recorded and the section left blank. This is because the heaters are not permanent the occupants may take them with them upon moving.</td>
</tr>
<tr>
<td>Fixed electric fan heaters:</td>
<td></td>
</tr>
<tr>
<td>Code: 694</td>
<td>RdSAP Convention 5.01</td>
</tr>
<tr>
<td>Fixed Water-filled or Oil-filled electric radiators:</td>
<td>Secondary heating:</td>
</tr>
<tr>
<td>Include if fixed emitter present regardless of whether main system(s) heat all rooms.</td>
<td></td>
</tr>
<tr>
<td>If more than one secondary: select the device that heats greatest number of habitable rooms.</td>
<td></td>
</tr>
<tr>
<td>If the same choose cheapest fuel – if same fuel select the device with the lowest efficiency.</td>
<td></td>
</tr>
<tr>
<td>Electric focal point fires are included even if not wired by fixed spur.</td>
<td></td>
</tr>
</tbody>
</table>
Heating controls

For boilers, warm air systems, heat pumps, community heating schemes and room heaters the control systems are formed from a combination of:

- Room thermostats
- Programmers
- Thermostatic Radiator Valves (TRVs)
- Bypasses
- Boiler energy managers
- Zone controls

Selection of main heating control type will vary depending upon heating system, for example a warm air system will not have TRVs.

Storage heaters differ from these standard control types, they have:

- Manual charge control
- Automatic charge control
- CELECT-type control

Each type of control has a 'temperature adjustment' figure, in degrees centigrade, which is used to modify the living area mean internal temperature according to the control's effectiveness. A poor control will cause the dwelling temperature to be uncontrolled to a greater extent, and hence the mean internal temperature will be higher.

Room thermostats

| Room thermostat
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A sensing device to measure the air temperature within the building and switch on and off the space heating. A single target temperature may be set by the user.</strong></td>
</tr>
</tbody>
</table>
| | • Normally mounted on a wall in the lounge or hallway.
| | • Stops the boiler and heating pump when the desired temperature is reached.
| | • Can be wired, battery powered or wireless. |

| Programmable room thermostat
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A combined time switch and room thermostat that allows the user to set different target temperatures for space heating, usually in a daily or weekly cycle.</strong></td>
</tr>
</tbody>
</table>
| | • Provides both the functions of a programmer and room thermostat
| | • Should be recorded individually
| | • May or may not include delayed start feature |
**Thermostatic radiator valves (TRV)**

A radiator valve with an air temperature sensor, used to control the heat output from the radiator by adjusting the water flow.

- Are fitted on radiators and have a range of temperature settings
- TRVs allow the temperature to be controlled in different rooms
- Normally used in conjunction with a room thermostat, control system or a boiler energy manager

**Programmers and zone control**

Digital programmers, mini-programmers and time switches are just counted as ‘programmers’ – zone control looks similar – just don’t forget to check!

<table>
<thead>
<tr>
<th>Digital programmer</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Two switches operated by a clock to control the ‘on’ periods for space heating and hot water</td>
<td>Normally 7 day timing for both space heating and hot water</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time switch (or mini-programmer)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple to use</td>
<td>Allows space heating and hot water to be on at the same time, or hot water alone, but not heating alone</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Zone control</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Allows separate programming and control of different zones in addition to water heating (e.g. 3 channel, zone 1, zone 2 and hot water)</td>
<td>Separate room thermostats will be present in each zone</td>
</tr>
<tr>
<td>If two (or more) thermostats and programmers are present, this also qualifies as ‘zone control’ (will serve the same function as the integrated unit pictured)</td>
<td></td>
</tr>
</tbody>
</table>
**Boiler bypass**

Most boiler systems require some sort of bypass to ensure minimum boiler flow rates, and to protect the heating pump from dead-head conditions.

<table>
<thead>
<tr>
<th>A fixed bypass:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The presence of a radiator, or sometimes a towel rail, without a TRV</td>
</tr>
</tbody>
</table>

**An automatic bypass**

- Hand valve located between the flow and return circuit
- Looks very similar to a TRV

---

**Boiler energy manager**

A boiler energy manager monitors return and flow temperatures and reduces the boiler temperature accordingly.

Current Boiler Energy Managers include:

- DCD heating controller
- Dataterm Intelligent Heating Controller
- Eco-Burn
- Honeywell AQ6000
- Danfoss BEM 5000

Incorporates a number of functions into a single boiler control unit, features may include:

**Delayed start** - Reduces energy use by delaying the boiler start time when the weather is mild.

**Optimum start** - Adjusts the heating time to give the required dwelling comfort temperature at a chosen time.

**Night setback** - Allows a low temperature to be maintained at night. Provides improved comfort and reduced dwelling warm-up time in cold weather. A programmable room thermostat can provide this facility.

**Self-adaptive function** - reduces appliance ‘on’ time by learning from previous temperature characteristics.
**Anti-cycling control** - Delays boiler firing to reduce cycling frequency but is unlikely to provide significant energy savings. In some circumstances their use may reduce energy consumption, but usually at the expense of performance or comfort. Standalone units (those not supplied as part of the boiler) are generally not recommended as they provide little or no improvement over the minimum level of comfort.

A boiler energy manager may also include weather or load compensation.

**Weather or load compensation**

Not presently modelled in RdSAP, but here for information:

| ![Thermostat](image) | This is an internal or external thermostat that tells the boiler to adjust its temperature for space heating according to the internal (load compensation) or external (weather compensation) air temperature. Load and weather compensators cannot both be applied to a heating system - they are mutually exclusive. Can be specified for boiler systems or heat pumps only. |

**TIP**

A “Honeywell Frost Start” is disregarded as a part of the energy survey – this type of device is usually installed on to a boiler which is located outside of the heated envelope of the building (for example in a garage) the device will turn on the boiler for a short period if frosty conditions occur so that the water in the pipes does not freeze and damage the boiler or the distribution system. Essentially it is a safety device.
## Storage heater controls

<table>
<thead>
<tr>
<th>Manual (code 2401)</th>
<th>There are two types of control that can be recorded on the survey form.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Manual charge control</strong></td>
</tr>
<tr>
<td></td>
<td>The user adjusts the charging of the storage heater manually.</td>
</tr>
<tr>
<td>Automatic (code 2402)</td>
<td><strong>Automatic charge controls</strong></td>
</tr>
<tr>
<td></td>
<td>Storage heaters which are wired to a thermostat which detects the internal temperature and adjusts the charging of the storage heater accordingly.</td>
</tr>
<tr>
<td></td>
<td>A third type of control of CELECT control (where a central programmer is used to individually control each unit) – if this is present it should be recorded as ‘automatic charge control’.</td>
</tr>
</tbody>
</table>

## Space Cooling

Is there a ‘Space cooling system’ present? This is a simple yes/no answer.

<table>
<thead>
<tr>
<th>RdSAP Convention 9.04 – Cooling system present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed systems only, do not include reversible heat pumps.</td>
</tr>
</tbody>
</table>
Water heating

- Normally from the main heating system (code 901 or 914), the secondary (code 902) or an independent electric immersion only (code 903).
- Select the system which delivers the bulk of hot water during the year.
- If there is no water heating, select ‘no water heating system’ (code 999).
- Any back-up electric immersion heaters should be disregarded.
- Where water heating is from a back boiler or room heater with boiler, and the boiler provides water heating only, the appropriate fire or room heater without boiler is identified in the data collection process, and the water heating is identified as from main system 2 (code 914, with 0% heating) or from the secondary system (code 902).
- Record description on survey form as well as code.

Include any ‘solar water heating panel’ if present – cannot be entered as sole source. If no system is recorded (code 999) the RdSAP software will undertake the calculation based on an electric immersion system.

RdSAP Convention 6.04 - Separate boiler for DHW
Sometimes there is a separate boiler providing DHW only. A generic boiler can be selected from the water heating options. If the boiler is located in the database, specify two main heating systems with:
- main system 1 is the one providing space heating
- main system 2 is the DHW boiler
- percentage of main heat from system 2 is zero
- water heating is from main system 2 (code 914).

Hot water cylinders

If present, you must record:

<table>
<thead>
<tr>
<th>Approximate size:</th>
</tr>
</thead>
<tbody>
<tr>
<td>No access</td>
</tr>
<tr>
<td>Normal (90-130 litres) - typical for a boiler</td>
</tr>
<tr>
<td>Medium (131-170 litres) - for larger households</td>
</tr>
<tr>
<td>Large (＞170 litre) - typical for dual immersions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Insulation type:</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
</tr>
<tr>
<td>Spray foam</td>
</tr>
<tr>
<td>Jacket</td>
</tr>
</tbody>
</table>

- Insulation depth recorded in millimetres
- A ‘poor’ quality or badly fitting jacket should be recorded as having 50mm or less depth.
- Presence of a cylinder stat
- If not visible the cylinder stat can sometimes be located beneath the jacket
A separate thermal store should be recorded on the survey form as a hot water cylinder.

Where it is not possible to record the depth of the hot water insulation ‘no access’ should be selected on the survey form.

Mains pressure (or ‘unvented’) hot water systems are not treated in RdSAP any differently from conventional boiler-to-cylinder ‘vented’ hot water systems. DEAs must therefore record the cylinder (size, insulation etc.) in exactly the same way as a conventional cylinder system.

For DEAs information, one currently popular make of mains pressure hot water system is the ‘Megaflo’ (Heatrae Sadia). If you come across these in the field record as of the relevant size with 50mm of foam insulation.

A thermostat on an immersion heater is not considered to be a cylinder thermostat if the immersion operates as a back-up system and is not the primary hot water source (essentially the immersion thermostat is an emergency cut off). A separate cylinder thermostat is required in all cases for ‘Yes’ to be marked on the survey form.

**Dual immersion**

A dual immersion heater system is either one with two separate immersion heaters (one at the bottom of the cylinder and one close to the top) or a ‘two-in-one’ heater with two elements (one long and one short). The two-in-one type can be distinguished by two supply wires entering a single appliance.

There is one other type of two-in-one immersion heater encountered occasionally in older properties. These are normally attached to a switch with a ‘sink/bath’ option. This is still classified as a single immersion heater since the electricity used is the same for both elements for these particular systems.

**RdSAP Convention 6.03 – Dual immersion with single tariff**
Enter as a single immersion and include *Addendum 6.*
**Addendum 6**
The DEA must ensure that the following addendum is selected in RdSAP software so the EPC produced will clearly state how a storage heater or dual immersion has been modelled if run on a single tariff electric meter:

6. Off-peak appliance(s) with single meter.
“A dual rate appliance(s) is present with a single-rate supply. A single-rate appliance has been used for the assessment. Changing the electricity tariff to an off-peak (dual rate) supply is likely to reduce fuel costs and improve the energy rating.”

---

**Other hot water only systems**

If not supplied from the main (Main 1 code 901 or Main 2 code 914) or the secondary (code 902) heating system or from independent electric immersion element(s) only (code 903) the following options are also available:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>909</td>
<td>Independent electric water heating system (code 909)</td>
</tr>
<tr>
<td>907</td>
<td>Single-point gas water heater (code 907)</td>
</tr>
<tr>
<td>908</td>
<td>Multi-point gas water heater (code 908)</td>
</tr>
<tr>
<td>911</td>
<td>Boiler/circulator for water heating only (gas)</td>
</tr>
<tr>
<td>912</td>
<td>Boiler/circulator for water heating only (oil)</td>
</tr>
<tr>
<td>913</td>
<td>Boiler/circulator for water heating only (solid fuel)</td>
</tr>
</tbody>
</table>

Independent electric water heating system (code 909)
Point of use instantaneous water heaters – wall mounted or under worktop appliance with open swivel outlet or connection to one tap only. Mounted near sink. No flue and only electric fuel supply. ‘Single-point’ heaters, which are located at the point of use and serve only one outlet, do not have distribution losses.

Single-point gas water heater (code 907)
A gas single point water heater provides water to a sink immediately below the appliance itself.

Multi-point gas water heater (code 908)
A gas multi-point water heater provides hot water to more than one outlet; usually a sink in the kitchen and both basin and bath in the bathroom.

Boiler/circulator for water heating only
Gas (911), oil (912) or solid fuel (913).

Range cooker supplying domestic hot water only
Gas, oil and solid fuel range cookers can now be entered, select relevant code 921 to 931.

Hot water provided from community system
Code 950 if from boilers,
Code 951 if from CHP or
Code 952 if from heat pump.

When a hot water only appliance is present that is not covered by any other water heating system code (903-952), if two main heating systems are already entered, enter as secondary heating with hot water code 902. If there is any other form of fixed secondary heating, record the presence of the fixed secondary heating in site notes and comment that it could not be included.
**Flue gas heat recovery systems (FGHRS)**

A flue gas heat recovery unit is designed to extract further heat from the boiler flue gases before they are expelled to the outside. The incoming cold water supply to the boiler or thermal store is passed through the additional heat exchanger pre-heating it. The heat is transferred to the incoming cold water feed to the hot water system, pre-heating it and thereby reducing the heat input needed from the boiler (or other heat source). Therefore, it leads to savings in hot water costs.

FGHRS systems may be integral to the boiler or a separate unit mounted above the boiler. Some systems also have a separate thermal store, which may be heated also by a solar PV panel linked directly to an immersion heater.

The photo shows a flue gas heat recovery system in a separate unit mounted above the boiler. Record the details in your site notes and select the specific model from the product database in the RdSAP software.

Some boilers have integral FGHRS systems within the main boiler casing. Where this is the case you do not need to worry about recognising it since the details will be brought in to the RdSAP calculation automatically with the other boiler details when you select the boiler from the database.

For a FGHRS to be included in the RdSAP calculation, the specific system must be identified from the database so that the appropriate performance data is used. The database will also identify whether the system selected is associated with a PV module. If so, you can then enter the kWp, tilt, orientation and overshadowing of the PV module (options as for other PV systems (see section 8).

**RdSAP Convention 9.06 – Flue gas heat recovery**

Include only if found in database, identified in same way as for heating systems. When the model cannot be found no default option is available but the presence of the device should be recorded in site notes.
**Waste water heat recovery systems (WWHRS)**

The waste water heat recovery systems that are currently available reclaim some of the heat from the warm water running away from a shower, by running it through a heat exchanger before it runs away to the drain. The heat is transferred to the incoming cold water feed to the hot water system, pre-heating it and thereby reducing the heat input needed from the boiler (or other heat source). Therefore, as with a FGHRS, it leads to savings in hot water costs.

This photo shows a WWHRS system installed on the drain from an upstairs shower. In this case the heat exchanger is outside the dwelling on the external wall. Installing the system inside the insulated envelope of the dwelling is likely to be a better option where practical, in which case it may be more difficult to obtain photographic evidence.

Systems with a horizontal heat exchanger under the shower tray are also available (which is what you would need for a shower on the ground floor or in a flat). However, systems located upstairs with a vertical heat exchanger running down to the floor below are more efficient than those with a horizontal heat exchanger.

To include the system in your RdSAP data entry, you need the details of the manufacturer and model so that you can select the appropriate system from the product database in the RdSAP software. These details are most likely to come from documentary evidence provided by the property owner.

These systems cannot be used with instantaneous electric showers. Therefore details of the type(s) of shower in the property need to be recorded to determine whether or not a system should be recommended on the EPC.

The information required by RdSAP is as follows:
- Number of rooms with a bath and/or shower
  - Including rooms with only an electric shower
  - If two showers are found in a room, count as one
- Number of rooms with a mixer shower and no bath
- Number of rooms with a mixer shower and a bath

A waste water heat recovery system (WWHRS) is only recommended when a mixer shower is present. A mixer shower refers to a shower where the hot water is provided by a boiler (combi or regular), heat pump or immersion heater and mixed with a separate supply of cold water to achieve a comfortable temperature. A mixer shower attached to bath taps is recorded as such only if there is a permanent bracket over the bath and a shower curtain or screen.
Up to two systems can be included in RdSAP. Where one or two systems are installed you also need to record the following for each system:

- Number of mixer showers with WWHRS in rooms with a bath
- Number of mixer showers with WWHRS in rooms without a bath

**RdSAP Convention 9.08 – Waste water heat recovery**

Include only if found in database. When the model cannot be found no default option is available but the presence of the device should be recorded in site notes.

Number of rooms with bath and/or shower includes rooms with only an electric shower. If two showers found in a room, count as one.

Only mixer showers count for waste water heat recovery. Mixer shower means a shower where the hot water is provided by a boiler (combi or regular), heat pump or immersion heater. A mixer shower attached to bath taps is recorded as a mixer shower only if there is a permanent bracket over the bath and there is a shower curtain or screen.