

Customer Information & Operating Instructions For:-

- Electric Tariffs
- Electric Heating Systems
- Electric Hot Water Systems

INTRODUCTION

Some of the properties managed by Aire Valley Homes use electricity to power heating and hot water systems.

In such properties generally one of the following tariffs and one or more of the systems may be used / fitted in your home:-

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This document aims to provide you with an overview of how the above tariffs and systems operate.

ECONOMY 7 - TARIFF

What is Economy 7?

Economy 7 is an electricity tariff with different pricing structures according to the time of day. The energy you use during the night costs less, per unit, than energy used during the day with Economy 7.

How does Economy 7 work?

An important factor to take into consideration with Economy 7 is that, although you can heat your water and storage heater continually throughout the night, this may be insufficient to last you through the day. The morning is generally nice and warm, with enough hot water for a bath or shower, but as you reach the evening your house will probably start growing colder.

With Economy 7 you'll use more energy during the night than the day, so you will save money. However, you need to be using roughly 20% of your energy consumption at night to be making a saving. The cheaper tariff usually starts around 1am and finishes around 8am (this can vary by supplier and region). Some regions use radio teleswitching to control consumers' systems and vary the timing. This uses data carried on the 198 kHz BBC Radio 4 Long Wave signal.

Some Economy 7 tariffs may charge you almost double the standard rate for any energy you use during the day, which can quickly cancel out any savings you've made through using Economy 7 at night.

Houses using the Economy 7 tariff require a special electricity meter which provides two different readings - one for the day period and one for the night period. The night (off-peak) period lasts for seven hours, hence the name.



Economy 7 Meter and Teleswitcher

The night **storage heater** and hot water boilers are on the ordinary circuit, but only switch on when the night rate is activated. Any electrical appliance in use during this period therefore runs at a lower rate of billing, such as fridges, freezers, dish washers, washing machines or a tumble dryer set to start using a timing device.

How can I tell if my hot water is heated by economy 7?

There are a number of clues which will indicate if your hot water is heated by Economy 7, these are as follows:-

- The hot water cylinder will have two thermostats and two cables attached to. One at the top and one at the bottom.
- The electricity meter will have two sets of dials or numbers to read. The meter may also be white. Your hot water is heated using electricity on an "off-peak" tariff known as Economy 7. This tariff provides you with cheaper rate electricity from

12.30 am until 07.30 am (The **Night**). The aim is to heat as much water as possible with cheaper rate electricity to minimise the use of the more expensive daytime rate for topping up the hot water supply.

- The Energy Unit recommend that the hot water cylinder thermostats are set to 60 0C/ 140 0F for efficiency in most properties, but it will depend upon how much hot water you are using. If you find that you have to boost your hot water throughout the day-time it may be worth considering increasing the temperature of your cylinder thermostats. The Energy unit can visit your home to do this for you.

What is night?

Night is a continuous 7 hour period between 12:30 midnight and 7:30am during the winter and 1:30am and 8:30am during the summer (*local circumstances can vary these times*).

What is the difference between day rates and a general domestic tariff?

Daytime electricity and standing charges are higher, however, any appliance used at night will benefit from the lower rate. The heating and water heating systems have been specially designed to take advantage of the lower night rate.

How can I save energy and money?

There are a number of ways you can reduce your energy consumption. If you need further information please contact your local Neighbourhood Housing Office for energy advice.

ECONOMY 10 - TARIFF

What is Economy 10?

Like Economy 7, this tariff best suits households with storage heaters or warm air heating. If you are on Economy 7 and you are running out of hot water or if your storage heaters are cooling off by the evening then Economy 10 could be a suitable tariff for you.

How does Economy 10 work?

To be on an Economy 10 tariff you must have an Economy 10 meter. These differ from standard meters as they have additional capability, which enables them to measure the consumption of electricity between the set Economy 10 hours specified by the supplier.

Almost any home can have an Economy 10 meter fitted if desired. Be aware that there may be a charge for installing the meter. To enquire about this please contact your local electricity distribution company.

The structure of the 10 off peak hours is as follows;

- 3 hours in the afternoon
- 2 hours in the evening
- 5 hours over night

The time of the designated hours can vary from supplier to supplier and in different regions, so it's best to ask the supplier directly for precise times.

Not all suppliers offer tariffs that support Economy 10. Suppliers that do not offer Economy 10 could migrate you onto their Economy 7 tariff but this may or may not be advantageous. You would need to consider the unit rates offered against your consumption over the specified hours.

The **storage heater** and hot water boilers are on the ordinary circuit, but only switch on when the off peak period is activated. Any electrical appliance in use during this period therefore runs at a lower rate of billing, such as fridges, freezers, dish washers, washing machines or a tumble dryer set to start using a timing device.

How can I tell if my hot water is heated by economy 10?

There are a number of clues which will indicate if your hot water is heated by Economy 10, these are as follows:-

- The hot water cylinder will have two thermostats and two cables attached to. One at the top and one at the bottom.
- The electricity meter will have two sets of dials or numbers to read. The meter may also be white. Your hot water is heated using electricity on an "off-peak" tariff known as Economy 10. This tariff provides you with cheaper rate electricity over 10 off peak hours as follows; 3 hours in the afternoon, 2 hours in the evening and 5 hours during night. The aim is to heat as much water as possible with cheaper rate electricity to minimise the use of the more expensive daytime rate for topping up the hot water supply.
- The Energy Unit recommend that the hot water cylinder thermostats are set to 60 0C/ 140 0F for efficiency in most properties, but it will depend upon how much hot water you are using. If you find that you have to boost your hot water throughout the day-time it may be worth considering increasing the temperature of your cylinder thermostats. The Energy unit can visit your home to do this for you.

How can I save energy and money?

To cut your bills with Economy 10, you will need to schedule around 20% of your energy consumption during the discounted period. Economy 10 users often set their domestic hot water heaters, night storage heaters and appliances to automatically switch on during the cheaper period.

STORAGE HEATERS - SYSTEM

A storage heater is an electrical appliance which stores heat at a time when base load electricity is available at a low price, usually during the night, and releases it during the day. Heat is usually stored in clay bricks or other ceramic material because of its low cost and high specific heat capacity.

Storage heaters are usually used in conjunction with a two-tariff electricity meter which records separately the electricity used during the off-peak period so that it can be billed at a lower rate. In order to derive any benefit from a storage heater, the house must be on a special electricity tariff.

Storage heaters usually have two controls - a charge control (often called "input"), which controls the amount of heat stored, and the draught control (often called "output"), which controls the rate at which heat is released. These controls may be set by the user, or in some models are automatic and allow you to set the target room temperature using a thermostat.

Many units also contain a conventional electric heater which can be used to give a boost in heat output during the day. If this feature is relied upon too much, a lot of peak time electricity will be used and the storage heater will prove expensive to run.

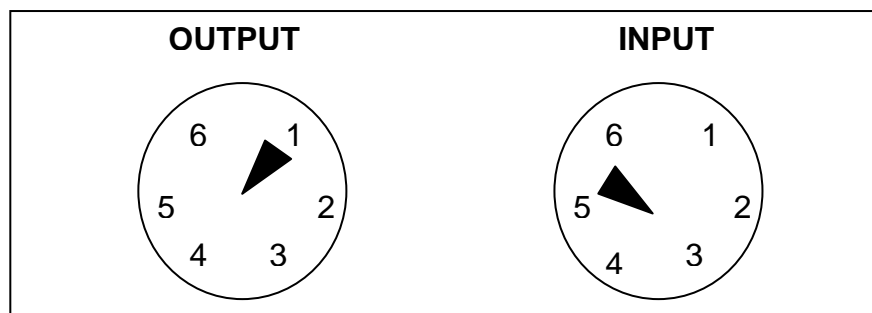
Getting the most out of your storage heaters.

To achieve the most efficient use from this heating system you must make use of the weather forecasts and decide your heating requirements for the following day. A storage heater cannot produce instant heat but if the controls are set correctly it can often provide adequate levels of heating for a length of time.

Setting the controls.

The **Input** dial controls how much electricity is absorbed and stored by the heater during the night ready to warm your home the following day. The first time you use your heater set this control to around 5. You will then be able to decide if it was too hot or too cold and adjust the dial accordingly. Only you can decide upon the best setting for your home & life style by experience.

The **Output** - This is also known as the room temperature boost control. Generally this should be set at number 1 throughout the day and turned up in the evening for a boost if required. When this control is left at number 1 the heat stored during the night is released steadily throughout the day. As the stored heat reduces, the surface temperature of the heater becomes colder; at this point turning the output to a higher setting allows the remaining heat to be released. Remember to return the setting to number 1 before going to bed as this will allow the storage heater to work correctly the following morning. Using the output in this way enables you to use all the heat that has been stored and reduce any unnecessary use of fuel.



The **Weather** during the winter and summer predictions can be made about how much heating you will need but in the Spring & Autumn it can be more difficult, as temperatures vary on a daily basis. This means that if you know the temperature is going to fall the next day you must turn the output dial to a higher setting to make sure there will be enough heat to keep you warm, alternatively, if a warm spell is due turn down the output control.

CREDA COMFORTAIRE - SYSTEM

How does it work?

The Electricaire unit stores heat using low-cost electricity during the prescribed periods, usually through an Economy 7 or 10 tariffs.

A fan in the unit draws filtered air through the storage core and passes it, when it is needed, through ducts which have outlet registers in various rooms.

What do the controls do?

The operation of the heating system is controlled by:-

- (i) **Night Input Control**
This regulates the amount of heat stored overnight at the cheap rate. The amount you will need will vary of course, with the weather, but generally, the MILD and Moderate settings will be found satisfactory for spring and autumn, with the COLD and VERY COLD settings left for the colder winter periods.
- (ii) **Fan Switch**
This has two settings; NORMAL for general use and HIGH for the rapid initial heating of a cold room.
Whilst normally on the heater unit itself, in some installations both these controls are fitted away from the heater.
- (iii) **Room Thermostat**
This is a separate control and is normally sited in your living room. When you have switched the fan on, the thermostat will automatically stop and start it to maintain the room at the set temperature.
- (iv) **Programme Controller**
This is also a separate control which may be installed to switch the fan on for various selected periods of the day automatically, removing the need for you to do it manually.
- (v) **Air Outlet Registers**
There will be one or more air outlets in each room. The registers are adjustable by lever or separate key so that you can reduce the air flow or shut it off completely in some rooms.

Recommendations for economy in use

The level of warmth is normally controlled by the room thermostat. Keep this as low as is comfortable, remembering that even a degree or so lower makes an appreciable saving. Almost shutting the registers in unoccupied rooms is also an economy although hallways and landings should not be too starved of heat if you really want to feel the benefits of a centrally heated property.

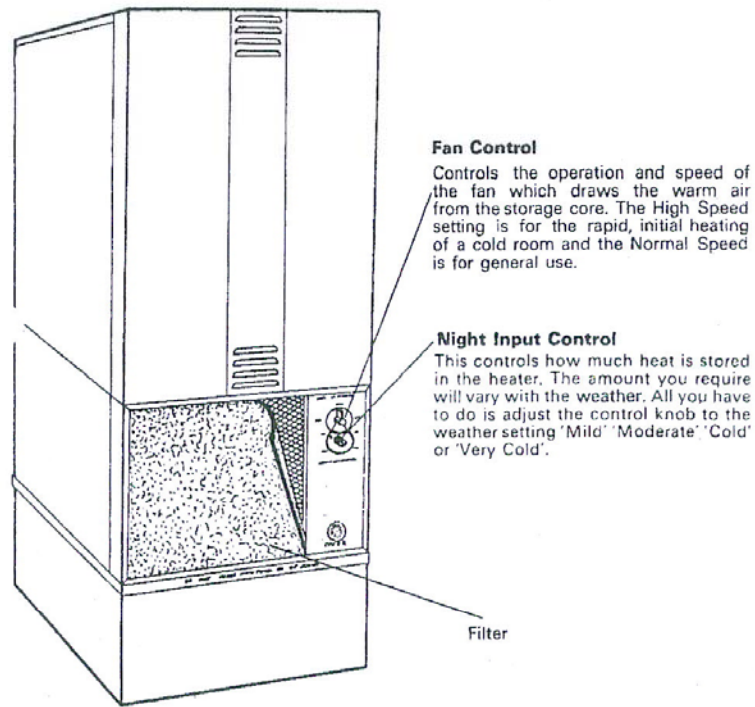
At night you can either switch the fan off altogether (manually or by a programme Controller) or, preferably, simply turn the room thermostat back to 55°F (13°C); this will keep a pleasant background warmth until the following morning.

If you go away for a day or more, turn the night input control to MILD and the room thermostat to 55°F (13°C).

It is better not to adjust the Night Input Control too frequently. Take account of a general weather condition rather than trying to forecast daily.

Do not forget the filter cleaning; it helps keep your home clean, if the filter becomes clogged, it will stop the flow of warm air.

In summer when you have no need of the heating system, switch it off at the mains isolation switches. Note the minimum setting on the Night input Control does not switch the Heater off.



Maintenance

All you need to do is to occasionally remove the Air Filter for cleaning about once a month is recommended, or perhaps more often in industrial areas. Shake off loose dust and if necessary, apply a vacuum cleaner to the front face of the filter pad.

NEVER ATTEMPT TO DISMANTLE ANY PARTS YOURSELF

WARNING: The outer surfaces of the heater become warm when it is operating. Although the amount of heat emitted is small, it could be dangerous to obstruct it. A ventilation space of 75mm or 3 inches must be left around the heater, and structures such as shelves or panelling must not be built on to it. Never put clothes or other articles on the Heater.

ELECTRIC UNDER FLOOR HEATING INCLUDING HOT WATER - SYSTEM

The following is a guide to assist customers living in properties with electric under-floor heating to understand how this system works and how to operate it to work efficiently.

This type of heating system also incorporates the domestic hot water system supplying all the hot water to the property.

The under-floor heating/hot water system works on an off peak tariff such as Economy 7 or 10 as follows:-

The heating systems thermostat that is mounted on the wall should be set to a minimum of 70°F.

It is most important that if the under-floor heating/ hot water system to the property is used, then it must be used as the sole means of heating the property. Other forms of heating or heaters should not be used as this may cause the thermostat to register above 70 degrees causing the system not to be charged up correctly on the cheaper off peak tariff and leaving the only means to heat the property by boosting the system with the normal and more expensive rate of electricity.

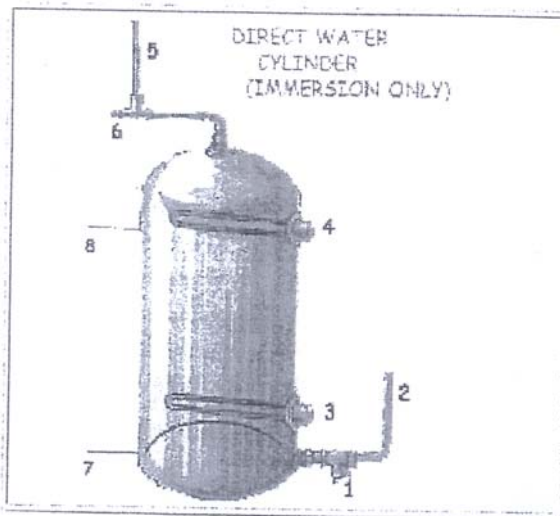
DOMESTIC ELECTRIC HOT WATER HEATING SYSTEMS

Stored Hot Water

Although the hot water is always stored in a cylinder or tank, this category can be further divided into three categories.

Immersion an Immersion heater is an electric element which screws into the hot water tank. This element is wired to the mains electrical supply via an isolating switch, a thermostat to control the temperature, and sometimes a timer which enables you to set the times you wish to have the water heated. Using a timer together with a well insulated tank, it is possible to heat water when electricity rates are at their cheapest i.e. Economy 7, and use it during the day. It is worth remembering that the hot water from the immersion heart is always drawn from the top of the cylinder, where it has risen over the cold water underneath (convection Current). The cold water, fed to the tank from underneath, gives the hot water pressure it needs to leave the cylinder, from the top, when required by the taps. Some tanks can contain two elements, giving you a choice as to how much water you want to heat up at any one time. It is quite rare nowadays for the immersion heater to be the only method of domestic water heating in a home and the immersion is generally used as a back up to one or both of the following two methods.

Direct Boiler System

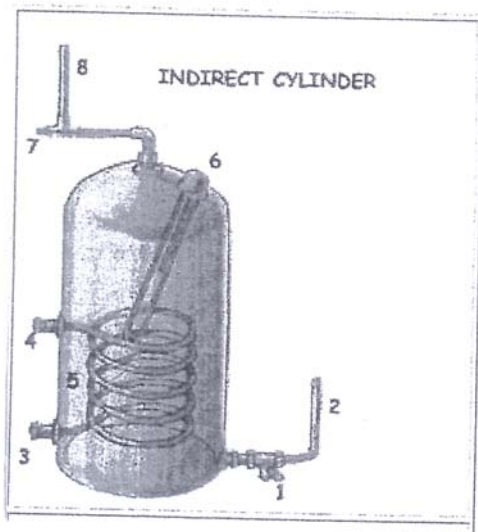


1. Drain Cock
2. Incoming cold feed
3. Main tank immersion (night use mostly)
4. Top up immersion
5. Vent pipe leading back to cold water tank
6. Hot pipe to feed taps
7. Cold feed out
8. Hot from boiler

In older properties, with a direct system, the hot water may be stored in a square galvanised tank. The principle is the same. Using the diagram above as a reference, another cold water pipe runs from the base of the cylinder to the boiler. The boiler heats the water and returns it to the tank higher up. When hot water is drawn from the tank, it is replaced by cold from the cold tank, which in turn is fed to the boiler. This is direct heating of the water by either a) the immersion or b) the boiler. The hot water is simply stored in the tank.

To identify a direct water system you will find the end of the vent pipe fixed above the cold water tank. This allows for any steam expansion in the cylinder to flow directly into the cold tank and not damage the cylinder or cause air locks in the system.

Indirect Boiler System



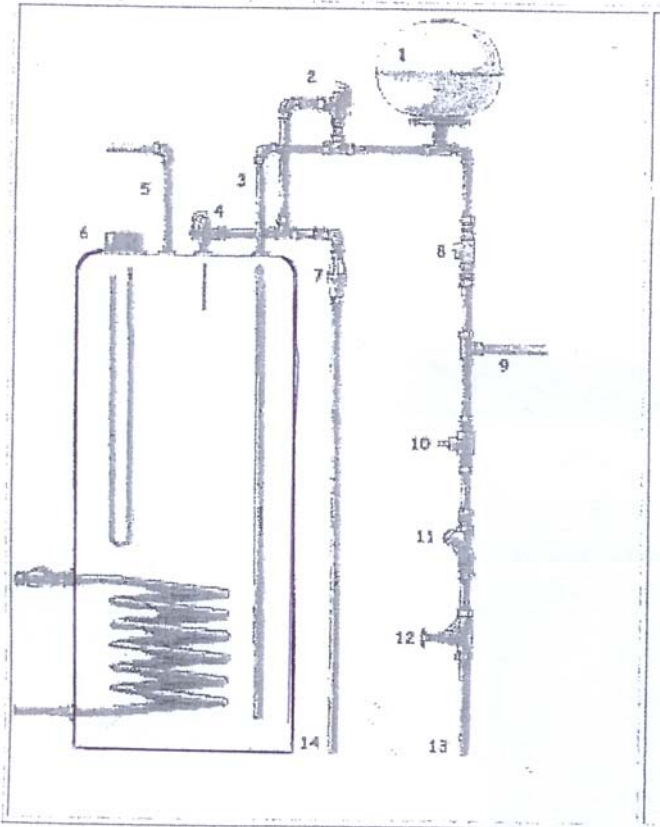
1. Drain Cock
2. Incoming cold feed
3. Return to boiler
4. Flow from boiler
5. Heat Exchanger
6. Immersion
7. Hot feed to taps
8. Vent pipe

With an Indirect system, the copper hot water cylinder contains a coil of pipe. This coil forms part of a run of pipework attached to the boiler. It is heated directly to the boiler. Indirectly, it heats the water cylinder. The coil, or 'heat exchanger' forms part of the central heating circuit, and its water heating abilities are purely a by-product of its main function, which is to heat the radiators. This heating is called the 'primary' circuit, the pipes running to and from the boiler are called the primary flow and return. The hot water tank operates in exactly the same way as the direct system.

To identify an indirect system, you will see two water tanks in your loft. The second, smaller one, is the feed for the primary circuit. It will top up the system when necessary and will also have a vent pipe over the top. The level of water in this tank will be considerably lower to allow the water to rise as it expands when it gets hot without overflowing.

Both of the boiler systems above are called 'vented' systems. Because of this vent pipe, they are open to atmospheric pressure and operate as 'Low pressure' systems. They both call for cold water from a cold tank stored generally in the roof space. Due to them being low pressure, sometimes the flow has to be increased by the use of pumps for both the domestic hot water and heating to provide greater flow.

Unvented Boiler System



1. Pressure vessel
2. Expansion relief valve
3. Cold water inlet
4. Temperature relief valve
5. Hot water outlet
6. Immersion heater
7. Tundish or visual overflow
8. Non-return valve
9. Cold to taps
10. Pressure limiter
11. Strainer
12. Stop Cock
13. Mains
14. Discharge pipe

The unvented system operates purely from the mains water. The principles of heating are the same, however, everything is under the pressure of the mains water which provides higher flow rates. Many safety devices are built into this type of system to accommodate for the greater pressure and expansion of the water. Although a small tank may be positioned in the loft for venting and the central heating system, no cold water storage tank is required.

Hot water cylinder capacity varies between 25 gallons to 50 gallons for normal domestic supply, with larger being enough to supply an average family for a day. Most cylinders are from thin copper and should be well lagged to prevent heat loss. Pre-lagged cylinders are available, these are coated with foamed polyurethane.

Thermal Store System

This system reverses the indirect principle detailed above. The boiler heats the water and sends it to a cylinder and then on to the central heating. On its way it heats, in the cylinder, via a very efficient heat exchanger, the mains fed water for the taps. An integral feed and expansion tank can be incorporated on top of the main tank. This system is so efficient, a thermostatic (cold/hot) mixer valve is built into the pipework before the hot reaches the taps or shower. For the two part tank to be viable, the system must be installed at the highest possible level in the house. However, it can be installed with the feed tank separately installed in the loft.