



Saving energy through intelligent water circulation

www.circosense.com

OVERVIEW

The CS 4000 is an innovative energy saving product and water compliance assistant, proven to reduce the amount of energy used in secondary return domestic hot water systems, which are installed in most commercial buildings.

Currently:

- hot water is circulated even when there is no demand
- water is heated more often than required
- significant levels of fuel are wasted resulting in high energy bills
- carbon emissions are higher than they should be

The patented CS 4000 device works differently from other energy saving devices as it uses Artificial Intelligence (AI) to control the system's circulation. In doing so, this reduces fuel consumption.

As well as providing energy savings, the CS 4000 offers visibility, control and reporting capabilities to assist and enhance existing water compliance management procedures.

The device will automatically flush sentinel water outlets for 60 seconds (default), record, store and export reports to help with water compliance. This means you can make significant savings on the manual labour costs associated with monthly outlet temperature recording.

There are various finance models available for clients including a shared savings model, meaning no upfront costs.

Secondary return domestic hot water systems are designed to ensure that hot water is readily available at every outlet within a property without the need to draw excess amounts of water. This is achieved by installing a circulation pump onto the domestic hot water loop and circulating the water around the building.

HOW IT WORKS

The CS 4000 switches on your circulation pump when required in three distinct operating modes:

AI controlled circulation

The CS 4000 device starts off by learning when you need water over a two-week period.

This information is sent to a cloud-based server which stores the usage patterns, analyses them and uses the algorithm to set the circulation cycles.

Usage patterns are continuously sent to the server which adjusts the look-ahead running times to the actual running times.

Water compliance

The device has a built-in purge cycle, so if it's not used within a 3-hour period, it automatically circulates the water.

Additionally, the CS 4000 has external temperature sensors installed around the loop to prevent any key parts of the system being in a danger band.

This helps to ensure that HSE guidelines for water circulation are strictly adhered to.

Random request

Should hot water be required outside the normal recognised usage patterns, the CS 4000 will automatically react to this.

Temperature sensors detect the call for water and reactivate the circulation pump.

Provided the BMS system has not turned off the system, water will be circulated immediately and will be available at the outlet.

KEY FEATURES



Reduced CO₂ emissions



Artificial Intelligence (AI)



Improved compliance regime & reduced labour costs



Average savings of 38%



Web portal & app



Sharing Savings Options

COMPLIANCE ASSISTANCE

Stored hot water temperature

The device can control the temperature of the stored hot water - either locally or remotely through the user interface - to ensure water is stored above 60°C.

Sentinel point temperature test

The CS 4000 uses Radio Frequency (RF) sensor valves which are fitted to the sentinel points, to record, monitor and store water temperatures.

These RF sensor valves will be fitted to the hot water pipe (before the taps) and programmed to open on a monthly basis, or as per your compliance regime. The water temperatures will be recorded after 60 seconds, stored and can then be exported in excel format.

Pasteurisation cycle

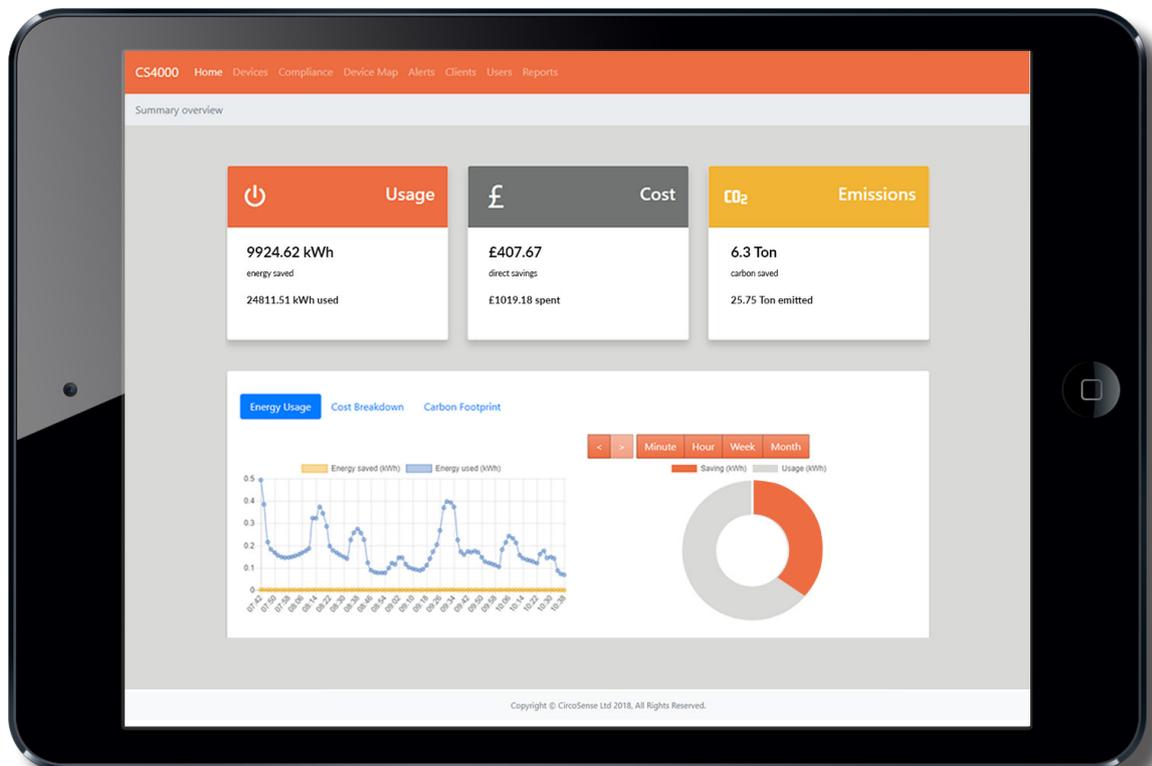
The device raises the stored hot water temperature to 72°C and once achieved, will circulate the water for 60 minutes. The RF sensor valves will open in succession allowing water to draw through at 72°C. This exercise is completed at a time to suit each building use - usually when the building is non-operational.

Circulation cycling

If the water on the loop sits within a temperature range that promotes bacterial growth for a period of time (default setting is three hours) the CS 4000 will circulate the water round the loop, ensuring there is no opportunity for bacteria to form and spread.

USER INTERFACE

The CS 4000 incorporates a user interface capable of demonstrating real-time savings, information on your hot water system's operational analytics, compliance status, pump run times and many other functions.



Compliance reporting

Reports are exportable for compliance, non-compliance, savings and sentinel point compliance.

Device real-time savings

£, kWh, CO₂ information is provided on a site-by-site and accumulative basis. Information is also provided for return on investment calculations, suitable for gainshare models. Savings calculation methodology approved to IPMVP* standards.

Notifications functions

Default notifications are set for low stored water temperatures and for water returning below 50°C, plus many other capabilities.

Operational analytics

Flow, return, cold water, stored water temperatures and pump run times are all available in graph format and are fully exportable.

*International Performance Measurement and Verification Protocol (IPMVP)

CASE STUDY

Nottingham City Council Leisure Facility



Key facts and figures:

- Part of a 10 site install programme
- 30.68% reduction in gas consumption for hot water
- No disruption to the facility
- 14.95 tonnes carbon reduction
- 2.64 years payback

Following a previous “Proof of Concept” installation completed at a nearby site, which resulted in significant energy and fuel cost savings, Nottingham City Council decided to roll out the CircoSense device across a further 10 sites. Harvey Hadden Sports Centre was included in the project, and forms part of their Energy Strategy 2010 – 2020 carbon reduction targets.

After the trial period concluded, it was established that the CircoSense unit had resulted in savings of 30.68% on the cost of heating hot water at the site. In addition, annual savings of 14.95 tonnes were made in carbon savings, with a payback period of 2.64 years.

“ Following a successful trial at Victoria Leisure Centre, we decided to install a further 12 units across 10 sites to replicate the savings achieved during the trial installation. ”

James Kirkwood
Energy Projects Officer
Nottingham City Council

CASE STUDY

Apex Housing Association Care Homes



In an effort to reduce operating costs within their properties, the intelligent CircoSense technology was installed to Fortwell House - one of Apex Housing's care homes.

The CircoSense unit resulted in savings of 51% on the cost of heating hot water at the site.

In addition, the CircoSense unit reduced the annual carbon emissions at the care home by 3.9 tonnes.

Apex Housing have also installed the unit to their head office and an additional care home, both resulting in cost savings.

Key facts and figures:

- 51% reduction in hot water costs at Fortwell House
- 3.9 tonnes carbon reduction at Fortwell House
- 38.4% reduction in hot water costs at Brickfield Court (additional care home)
- 37% reduction in hot water costs at Apex Housing's head office

“ We decided to put a trial in our care home in Letterkenny, where the CircoSense unit has proven to reduce our energy bills and lower the carbon emissions at the site.”

Paul Rodgers
Property Services
Apex Housing

CASE STUDY

North Ayrshire Council Schools



The CircoSense unit which was installed at Auchenharvie Academy learned the hot water usage patterns of the school over a six-week period. Once all baseline data had been gathered, the technology then used this data to predict the hot water usage moving forward whilst ensuring that hot water was always available on demand.

By turning off the pump when not required, the technology resulted in savings of 52.4% on the cost of heating hot water at the school, thus reducing carbon emissions and costs which could be reinvested elsewhere for the school.

The Council also installed the system to another school, Woodlands Primary School, which resulted in savings of 44.7% on the cost of heating hot water.

Key facts and figures:

- 52.4% hot water cost saving at Auchenharvie Academy
- 44.7% hot water cost saving at Woodlands Primary School
- 22.2 tonnes carbon reduction at Auchenharvie Academy
- 14.1 tonnes carbon reduction at Woodlands Primary School

“ We were keen to identify which savings could be achieved on these sites and are delighted at the savings achieved by the CircoSense technology. We will be looking to install this technology to further properties in the near future. ”

Hugh Paton
Energy Officer
North Ayrshire Council

FINANCE

There are various finance options available to help with your budget. For instance, Salix Finance Ltd. provides interest-free Government funding to the public sector to improve their energy efficiency, reduce carbon emissions and lower energy bills. Salix currently have funding available for England, Scotland and Wales.

As well as external funding opportunities we are also offering a Shared Savings Scheme, meaning you don't have to pay a thing and you are cashflow positive from day one.

Our Returns and Finance Calculator will explore a range of criteria and options to suit your own individual business model and requirements to ensure you receive the maximum return on investment.



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