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Why is so much energy wasted with pumps?

Problem:

Pumps are running 24/7

Pumps typically go unobserved year in, year out, and because they're running okay, people often turn a blind eye to the fact that they use a lot of power while providing services such as heating, cooling and water supply. Yet the pumps are often set up to accommodate worst case scenarios. For example, heat pumps work to keep buildings warm on cold, snowy days yet this extreme in temperature doesn't always occur, so the pump is running more than it needs to. There is also a general lack of pump control, and variable speed drives can be incorrectly programmed.

Solution:

Our engineers can conduct a thorough system analysis to identify the system usage. With this data, we are able to make the necessary modifications such as alter the output so that they can run at 50%, which equates to 25% of total power consumption. Often basic pump control can be used to save around 40% of the energy used. We also review how the pumps are controlled as it may be possible to run at 50% at night, or even turn it off.

Problem:

Pumps are often oversized by adding margins of error.

Pumps are an integral part of systems such as heating and chilling (either boilers or air handling units), and during the design phase of the system, a margin of error is often added on to the plan for safety's sake. The engineers who then lay the pipework will also add a margin of error, as will the specifiers who install the pump.

These small (10%) margins for errors can sometimes add up to 45% more pressure than is needed.

Solution:

Our engineers can evaluate what is really being used on site by analysing the system requirements and removing all the guesswork, before then supplying the optimal pump for the project. Yet sometimes it goes beyond the pump. An accurate system analysis means that an exact duty point can be selected. With this data, we can customise a pump to suit that exact system requirement which maximises its efficiency. We also review how the pump is controlled as it may be possible to run at 50% at night, or even turn it off.

Problem:

Pumps, by design, are inherently inefficient.

Technology has moved on leaps and bounds in the past few decades. Older pumps that are belt-driven are not as efficient as those with a direct drive. A belt loses 20% of power regardless of the function it is performing.

Solution:

We recommend installing a direct drive pump which can save 30-40% of power in any application. In addition to making energy savings, you will reduce maintenance costs and keep downtime to an absolute minimum.

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Problem:

A building layout, or process, has been altered which makes the pumps inefficient for the new process.

When factories are altered, or processes changed, the main focus of the maintenance crew is to keep the solutions that still work, and not reconsider if it is the most efficient solution. So where previously there may have been 20 machines, and now there are 10, it wouldn't be uncommon to find the original pump still in use "because it's always been that way."

Solution:

If your system has been modified, our engineers are able to re-evaluate the system and make suitable recommendations. We are able to specify a pump and controls to suit your exact requirements. For example, we recently worked with a hospital in Banbury to replace their existing 37kW pump with an 18.5kW pump and still service the hospital as required.
On a smaller scale, we can replace 5.5kW with 3kW pumps which save 2.5kW per hour. This equates to 21,900kW a year – approximately £2,190 in savings.

Problem:

It's the wrong pump.

Some pumps are incorrectly specified at the beginning of a project, either because they are put in as temporary solutions or because there is no other equipment available.

Solution:

Our engineers will revaluate the system with the pumps and find the solution right for your application.

Problem:

The pumps are old.

Aging is always going to be an issue, as almost everything depreciates and becomes more inefficient with age.

Solution:

Pumps should be serviced every three years to ensure that they are running as efficiently as it could be. If you've not had someone look at the systems within the past 12 months though, it's worth getting an expert in to make sure that they're all running efficiently.

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Why should I maintain my pump system?

All pump systems consist of mechanical devices which require maintenance periodically. The frequency of maintenance depends on the demands and loads of a system, and how critical its application. Regular maintenance to a pump system is critical for longevity and reliability.

Problems:

1. A sewage pump system

Sewage pump system failures can be caused by increasing amounts of blockages within the pumps and valves, which trigger unreliability (meaning the pump could fail without any prior warning) and result in sewage flooding. The call-outs are often expensive and require tankering.

2. Cold water booster sets

An unmaintained system will result in inconsistent water pressure and ultimately cause failure of your water supply. Typically on a cold water system, it will be the non-return valve or pressure vessel which fails, causing damage to the pipework and creating an erratic water pressure. A block of flats with no water soon becomes an emergency.

All pumps require periodic inspection to ensure that issues are discovered before they become critical, and we recommend servicing equipment every 12 months or in line with the manufacturers' minimum recommendations. There is a danger of wasting a huge amount of power if pumps are running incorrectly.

Solutions:

A well-maintained pump system is far less likely to give you unexpected issues. It will give you peace of mind even when the system is under maximum load, and will still remain stable, rather than fail at the most inconvenient time. When we service a system, we assess it and find out how it can be made more reliable.

1. A sewage pump system

We remove and clean the existing pump, and check the bearing, impeller and its general state. We also ensure the non-return and gate valves are pumping correctly, and the pipework and guard rails aren't compromised in any way. Our engineers carry out full electrical and level control system checks, as well as ensuring the safety and security of the installation. There may be water ingress in the system, but we can detect this at an early stage and recommend a replacement pump or repair the existing pump before it fails.

2. Cold water booster sets

Maintenance of a cold water booster set will ensure the reliability of the pumps, and a more consistent water pressure throughout. Our engineers check pressure vessel(s), pumps for failure of mechanical seals, motor bearings and all isolation and non-return valves to make sure that you have a fresh, clean water supply delivered consistently.

Regular maintenance acts as a type of insurance against failure. A broken three-inch pipe could mean that water comes out of it at almost 1,000litres/minute. Similarly, a broken non-return valve could result in water freely circulating around the system, and large amounts of wasted power. It also has the potential of heating up the water, causing serious issues like legionella.

It's important that all pumps are inspected regularly and that particular attention is given to motors, bearings and mechanical seals.

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Introducing ProServ

Proactive maintenance ensures the systems longevity, reduces energy consumption, saves money and increases safety in the long term. Proserv provides users with proactive pump maintenance across the business, with a variety of different service levels used to form a tailored plan to suit ever-changing needs.

Based on hundreds of reference sites, we have created Bronze, Silver and Gold packages to cater for the vast majority of maintenance needs. Proserv packages range from basic preventative sewage and storm water pump maintenance with 24/7 technical support, through to a proactive service agreement which extends through the latest energy-saving measures, to the ultimate pump system asset management service. Should that not be enough, we can work with you to develop a Proserv Platinum package where we provide a customised solution dedicated to your requirements.

PROSERV CONTRACT LEVELS	BRONZE	SILVER	GOLD	DETAILS
Preventative Maintenance	X	X	X	We'll recommend what's needed and how often, depending upon your site and equipment
Technical support	X	X	X	Telephone support from our expert team helps to you to solve issues as quickly as possible
Wearing Parts Discount	0%	5%	10%	Even with the best system design, parts will wear. So you gain a corresponding level of discount on the spares when this happens
Online Portal Asset Management	X	X	X	A comprehensive online portal containing service reports, certificates, asset history, location, details, photos and FAQ's
Health Check/Electrical Service		X	X	We attend site and carry out a visual check on all pumps including, heating pumps, chiller pumps. We report findings and make recommendations
Energy Saving		X	X	We assess all of your pump systems annually, for areas where you could save energy
Remote Monitoring (SMS etc.)			X	This allows us to monitor your system remotely, so we can prevent potential issues and respond accordingly
Emergency Callouts			Callouts Per Annum	Should your pump system block or fail due to something unforseen, we will attend site in a timely manner, inspect your system and recommend solutions

Example

Our engineers recently worked with a client who had spent £140,000 in 18 months maintaining and servicing pumps before reviewing them properly. We rebuilt the eight pump stations and included remote monitoring to proactively manage the site. Our client now only spends £17,500 per annum on the maintenance of the pump systems and has had no pump failures over the past 6 years.

The remote monitoring warns us of power failure and excessive pump run time. Combined with regular service visits, our engineers obviated problems which would otherwise have caused serious damage to the pumps. As the site is in a high flood risk area, our client has peace of mind that his site is safe and will reliably operate in the event of a flood.

Regular maintenance of a system will ensure that we have the knowledge and understanding of your system to allow us to make any changes with the minimum downtime.