

# Modernise to make the most of steam

**Think you know how to get the most out of your steam systems? The latest developments in steam trapping could make you think again.**

As an essential component of any efficient steam distribution system, steam traps are long established, dependably removing condensed liquid from steam lines to maintain optimum performance. Yet even these workhorses of the engineering world can sometimes offer room for improvement in terms of reduced maintenance and improved control and energy efficiency.

The tried and trusted mechanisms at the heart of today's steam traps have proved to be the best option for a wide range of applications, so these days it's often innovations in the surrounding installations that can help boost overall performance. Meanwhile, new working practices and new control technologies can also provide opportunities to increase efficiency.

## All-in-one solutions

The growing popularity of steam trapping stations is a great example. That's because steam traps are not installed in isolation. With factors such as future maintenance and safety requirements in mind, they typically need to be installed alongside peripheral equipment such as isolation valves, strainers and connectors. In a conventional set up, all these components must be specified and installed separately. This time-consuming specification and installation process creates opportunities for human error to creep in, and every connection is a potential leak path.

In contrast, a steam trapping station includes all the necessary equipment within a single body. Only the steam trap itself needs to be specified, saving considerable time and effort in selection and installation. Installation benefits can be improved still further if a 'quick-fit' connection system is used to fit the station into the steam line.

For users looking to adopt this approach, it's important to ensure that the internal components, such as the ball valves, check valve and strainer screen can all be replaced easily later on. Lockable handles on the isolation valves are a good idea to minimise the possibility of accidental operation during maintenance, thereby improving safety.

## Glorious isolation

Safety and speedy maintenance are also the key drivers

behind the use of double block and bleed valves in steam systems. These isolate steam traps or other components so maintenance can be carried out safely without having to shut down the entire system.

The most compact double block and bleed valve offers the same face-to-face dimensions as a single isolation valve. This makes it easy to retrofit double block and bleed valves without pipe cutting or welding. Better still, each valve takes up only a third of the pipeline length compared with conventional safety isolation installations fabricated on-site. In other words, they can be installed in spaces where it would be an impossible squeeze for equivalent safety systems.

## Listen and learn

For steam users responsible for major installations, one of the most challenging aspects of maintaining peak performance comes from looking after a big population of traps spread across the entire site. The emergence of wireless technology could point the way forward. New developments include systems specifically designed for this purpose.

Engineers could be alerted to any trap failures, whether they've failed open or closed and how much steam they're losing as a result. They can also see if a trap is not working at peak efficiency and investigate why. Blockages and leaks will be easier to spot. Crucially, all this could be observed across the entire operation from a single point of access.

Remote monitoring of a wide variety of equipment is well established in many industrial applications. Low-power, standards-based wireless communication devices such as ZigBee are already installed in millions of pieces of kit worldwide. In the case of steam traps, the techniques for recognising when a trap is underperforming will involve 'listening' to the sound frequencies generated through the equipment and comparing the acoustic performance with the expected sound profile to give a reliable assessment of the condition of the trap.

## Cool possibilities

Of course, installation and maintenance are not the only possible areas for steam system improvement. Energy efficiency is a critical consideration. Steam traps must be

properly specified and maintained to perform properly, but there are other ways in which they can be used to optimise energy usage, such as enabling users to extract more energy before returning condensate to the boiler.

The process works by reducing the temperature and pressure at which steam traps remove the condensate from the steam line, often by changing the type or rating of the traps.

However, there is a major caveat with this process because you can't get something for nothing when it comes to energy. In this case, the cooled condensate will be at a lower temperature when it eventually returns to the boiler feed, so any benefit might be undone by the need to augment feed water heating in the boiler room. In addition, it may not be practical because production quality or throughput might depend on delivering the maximum steam temperatures, or water logging may present a danger of corrosion or water hammer.

On the other hand, this advanced condensate control can often improve the plant's overall steam balance by, for example, eliminating excess flash steam and dealing with choking problems.

With multiple factors to consider, it can be a tricky balance to get right and many users would be well advised to seek expert support if they're trying to decide if this extraction is right for their application.

In fact, specifying steam traps in the first place is not always straightforward, so expert advice is often a good idea.

There is no 'one-size-fits-all' solution. Some suppliers promote orifice traps as a universal, maintenance-free solution, but these traps only function well under pretty constant loads and pressures, while a tiny orifice can become blocked. Mechanical and thermodynamic alternatives provide a more adaptable and reliable alternative in the long run.

For advice on how to get the most out of modern steam systems, contact Spirax Sarco.

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