Climate change and environmental saving necessities: pressure independence in water systems

Climate change and increasing population growth is having a big effect on the availability of water and therefore distribution to consumers. Lord Bevan recently called for the reduction of 40 litres of water per day per household. HL2024 can achieve this, as well as reducing energy and CO2 emissions.

Pressure independence for water companies

Pressure independence in the water system is a way to limit the use of water and pumping energy. What exactly is pressure independence and why is it so important? Ing. Eric van der Blom from Cenergist explains: "Normally, when the pressure on a connection or tap increases, the flow rate will increase as well. Consequently, the consumer uses more water. A higher flow rate in the distribution system causes a higher pressure loss and less flow further in the system.

To have enough flow and pressure at the end of the distribution system, the water company can increase the pressure at the pumping station, but this will increase the use of water at the beginning and the pressure loss further in the system. To avoid all of this, the unique pressure-independent flow controller HL2024 equalises the flow rate during both increasing and decreasing dynamic pressure. The pressure increase in the distribution system therefore has no influence on the maximum flow rate to the households."

In the figure below you will see the real measurements that at a pressure of 150 kPa dyn, the flow rate will be constant, even at pressures up to 1,000 kPa dyn (red line) as with a decreasing pressure 1,000 down to 150 kPa dyn (green line). The blue line gives the average of the lines pressure up and pressure down. There is a maximum 2% variation over the whole pressure range. Cenergist's HL2024 pressure independent flow controllers can be placed at different positions in the water system, even at the different taps in the houses.

Benefits for a Water Company

When HL2024 Inline Cartridge 3P or an easy to maintain HL2024 Cradle is installed at the water inlet into homes, there are numerous benefits:

1. The water flow at all connections is maximised to a fixed level, independent of the pressure at that place and at that time. The client at the end of the pipe has the same water flow as the client at the beginning of the pipe, providing the pressure is at least as high as the response pressure of HL2024 (150 kPa / 200 kPa). Pressure changes (upstream or downstream) in the distribution network do not affect the maximum flow.
2. Providing a better service at lower costs: HL2024 will set the peak consumption and thereby reduce the total consumption. As a result of lower peak consumptions pressure changes in the distribution network are less, distribution network and pumps are used more efficiently, CO2 emissions are reduced, and extensions of the distributing system may be delayed. Peak demand therefore becomes very predictable.
3. In case of high consumption, such as during dry periods in summertime, the pressure can be increased so that at the end of the distribution network there will still be sufficient pressure and flow. The maximum consumption per connecting point remains the same everywhere even when there is an increase in pressure.
4. The maximized amount of drinking water is supplied in various flow rates ranging from 5.0 to 23.4 l/min.

HL2024 Inline Cartridge 3P

HL2024 Cradle

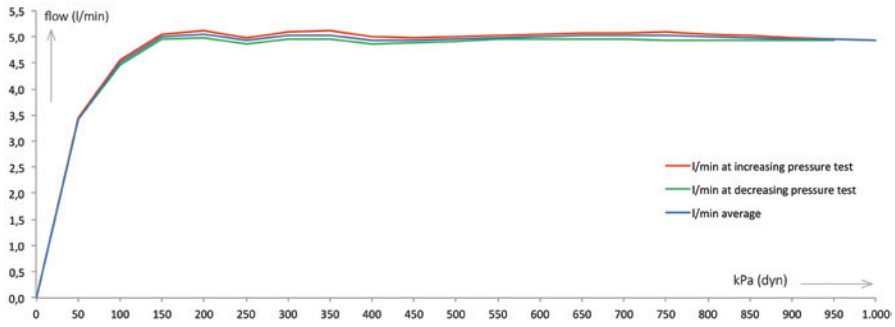
5. Installing HL2024 Inline Cartridge 3P has shown measured savings of 60 litres per day as proven by Alternative Heat in an independent report.

Benefits for the house or apartment owner or user

For the user there are the benefits of automatically saving water and energy, without doing anything. There is more comfort experienced because at any time of the day the same maximum amount of water is supplied. Water and energy bills are no longer affected by pressure in the water mains. This allows a better comparison regarding the use of water and energy. Whereas previously a lot of pressure and a large flow were normal, now the water no longer splashes out of sinks and washbasins.

For the owner, the production and supply of collective hot water in apartment buildings is cheaper due to the maximized and reduced use per customer. The installation can therefore be smaller and cheaper at the time of renovation. Operational costs are lower.

HL2024 is the only flow controller that is KIWA-certified for pressure independence (BRL K635/03) and meets all requirements for materials usage (Kiwa Water Mark) and primary European drinking water certifications. More information: **www.cenergist.com**



Graph: operation of the HL2024 pressure independent flow controller (version: 5.0 l/min)

‘Acoustic ears’ to listen for leaks

In a bid to save millions of litres of water being leaked from water pipes, Yorkshire Water will install a world record 34,000 ‘acoustic ears’ into its underground pipe network to audibly detect any water escapes.

£10m will be invested by the firm to install the sound devices to help meet a target to reduce leakage by 15 per cent by 2020, and a further 25% by 2025.

During a trial of the technology, 600 of the devices installed in the pipe network in West Yorkshire helped to identify 35 leaks in one month, which helped to save approximately 86,400 litres of water from being wasted.

Following that success, Yorkshire Water will now proceed to install 34,000 more of the devices by October this year covering 20 per cent of its water distribution areas. This will bring its total count to 40,000, more than any other water company in the world.

Martyn Hattersley, Head of Leakage Operations at Yorkshire Water, said: “Each acoustic ‘ear’, or logger, is capable of identifying a leak within a 150 meters radius,

which is much more accurate than current technology allows. It will give us a much greater understanding and visibility of what is happening in some of the areas most prone to leaks. By installing these devices we will help our Leakage Technicians save millions of litres of water being wasted which will improve our water sustainability and reduce roadwork impact on customers.”

How the acoustic loggers work is by listening continuously to the flow of the water through a pipe. If any variants in noise occur, an alarm is set off which alerts Yorkshire Water’s data analyst team. The data experts then analyse the noise to determine if it indicates a leak in the pipe and if so a leakage technician is sent out to find the precise location and raise work to repair the pipe within an average of 6 days.

Yorkshire Water’s innovation team is currently working with the open data community by sharing sound files with them to better understand the sound profile of a leaky pipe, which will help its own analysts detect leaks.