Systematic drinking water hygiene: sustainable, efficient and safe.

KEMPER Hygiene System KHS

More values. One system. KEMPER KHS.

KEMPER

DRIVING PROGRESS

Drinking water is essential: as a foodstuff and a resource.

We drink. We shower. We use water every day. On average, the per capita water consumption in Germany is 121 litres per day. Precious drinking water that has to meet the stringent requirements for purity and hygiene: as foodstuff number 1 that has a direct impact on our health and well-being.

But before we can use drinking water, it has to flow through the pipework to the tapping points in the building. And dangers lurk here that impact drinking water hygiene, for example, stagnation or high ambient temperatures. They can be reliably prevented with frequent exchange and circulation.

On the other hand, too much of the vital resource is often wasted. Although it is available in only limited quantities, it is rinsed down the drain without being put to good use. Using drinking water responsibly is not only important for good health, but also for the environment. After all, reduced water consumption leads to cost savings, fewer CO_2 emissions and lower energy consumption.

We accepted both challenges – and mastered them with just one system: the KEMPER Hygiene System KHS. Thanks to the innovative installation method, the drinking water in the pipework in buildings is always available and hygienic. And thanks to the intelligent holistic concept, water is saved in the process, which protects the environment and reduces running costs.

More values. One system. KEMPER KHS.

Operator’s duty: making a virtue of necessity.

Drinking water hygiene in all buildings is regulated by laws and ordinances in Germany. For good reason, because contaminated drinking water can become a health risk: not only in critical infrastructure, such as hospitals, care homes, schools or childcare facilities.

The fact is: in 2019, 1,547 cases of legionnaire’s disease were reported in Germany. Studies estimate that the actual cases of legionnaire’s disease at in fact up to 30,000 per year. Caused by? Often, the drinking water installation, because stagnation and a temperature rise in the installations can result in an explosive increase in legionella germs.

Cause: if individual bathrooms or tapping points are used very rarely or not at all there is no water exchange with conventional installation methods. This leads to stagnant water. A temperature rise to over 25°C can also lead to increased germ contamination, for example from legionella bacteria. The law therefore puts the onus on the operators of public buildings: they must guarantee perfectly hygienic drinking water in the entire building installation.

We know that hygienic drinking water is a major challenge for operators. As buildings become more complex along with increasing demands to protect resources, designs are becoming more problematic. Choosing the suitable installation method can therefore be vital – and making the operator's duties into a virtue. For example, with a holistic solution which prevents stagnation in an economically intelligent way, also conserves the resource of drinking water while complying with the relevant laws and ordinances.

With the KEMPER Hygiene System KHS you gain legal certainty in the design and operation of the drinking water installation, which conserves resources at the same time. This includes minimising the health risks for building users and creates operational and liability security for building owners and operators, for instance though protocols and operating instructions.

Hygienic drinking water supply: from the vision to the game changer.

In the beginning, we had a vision: drinking water should be supplied in buildings hygienically, efficiently and in a resource-friendly way at all times. Without stagnation and the formation of germs. Without high operating and overall costs. Without unnecessarily wasting water. But with great crisis flexibility and design reliability.

Admittedly, it was a great challenge. Because the stringent demands that we had made of ourselves could not be met with a conventional series installation. So we looked for new ideas – and our engineers worked shoulder-to-shoulder with scientists, operators and designers in implementing our vision. We knew that the result would revolutionise the supply of drinking water. And it has.

With the KEMPER Hygiene System KHS we have developed a holistic system that realises our vision – without compromises. It largely prevents stagnation during normal usage, helps with the conservation of resources, lowers running costs and increases flexibility in the event of changed usages.

And that pays for all involved: with more design reliability, greater variability and, above all, increased efficiency across all life-cycle phases of a building.

This is the KEMPER Hygiene System KHS.

We know that at first sight, the KEMPER KHS to ensure drinking water hygiene for domestic water installations in buildings seems rather complex. Especially as the optimised method of installation with the patented KHS Flow-Splitter breaks with traditional design approaches.

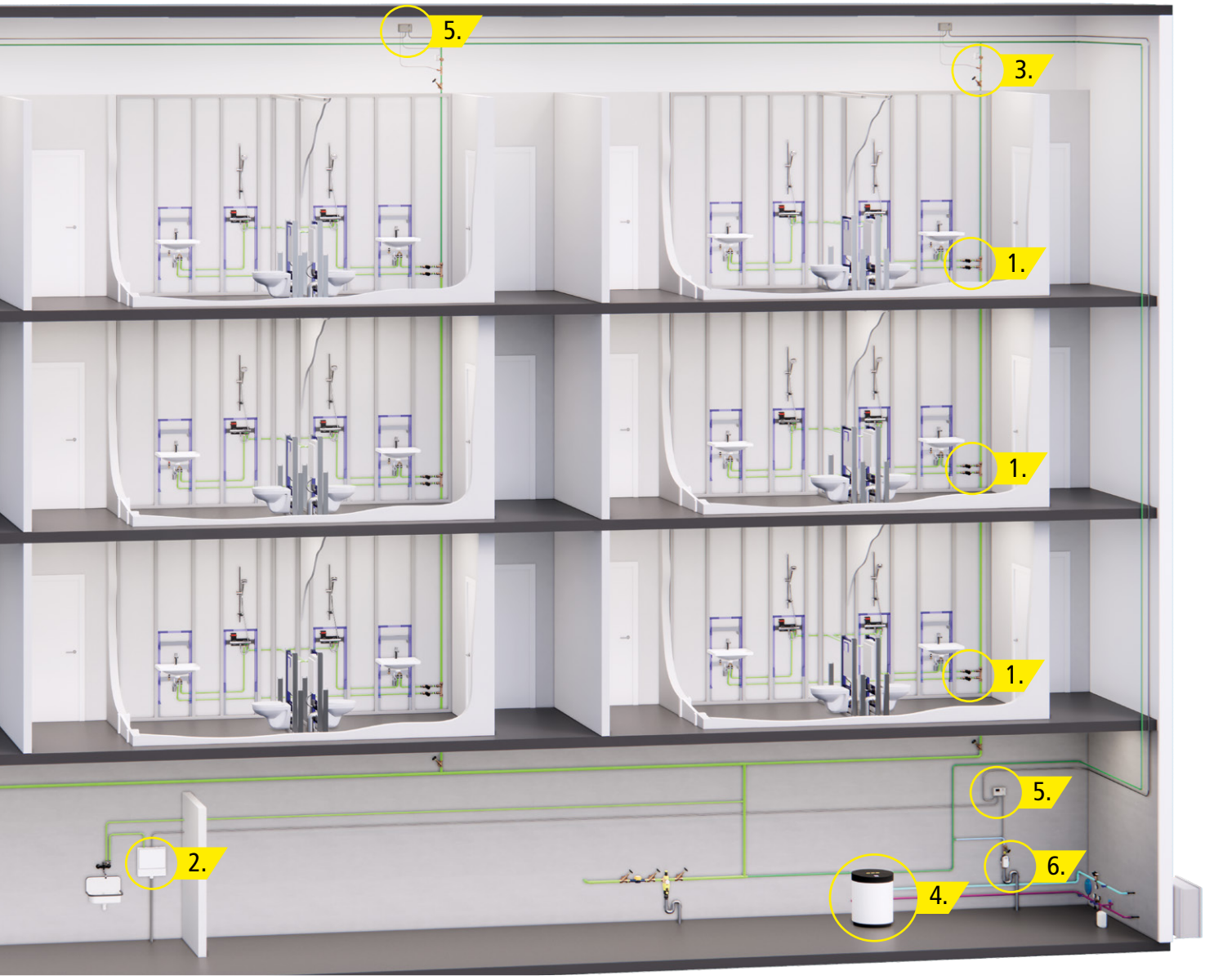
The KEMPER Hygiene System KHS is made up of innovative valve technology and intelligent pipe routing, which prevents the critical warming of the cold water. The intelligent interaction between all of the components ensures lasting and economic compliance with drinking water hygiene.

If you take a short while to examine the system you will quickly see that it doesn't just follow a holistic concept, but also solves many of the common challenges merely by virtue of its principle.

The Basic Idea of the KEMPER Hygiene System KHS

We developed the KEMPER Hygiene System KHS for buildings in which a large number of bathrooms are needed – such as hospitals, care homes or hotels. The basis of our solution is the further development of the conventional installation into a loop installation. Here, the pipe is routed back to the basic pipe after the last tapping point and connected by our patented KHS Flow-Splitter

Find out more about the components of the **KEMPER Hygiene System KHS**here



Components
KEMPER Hygiene System KHS

1.

KHS
Flow-Splitters
Figure 650

2.

KHS Hygiene
Flush Box
Figure 689 03

3.

KHS CoolFlow
cold water balancing valve
Figure 615 0G

4.

KHS CoolFlow
cooler
Figure 610 01

5.

KHS
control systems
Figure 686 02 008
Figure 686 02 006

6.

KHS
Flush Point
Figure 684 05

Simply more values: with just one system.

Stagnation prevention

As a result of the further development of series installation into a loop installation, the pipe after the last tapping point in the bathroom is routed back to the distribution pipe and connected to a flow-splitter following the Venturi principle.

The effect: for every natural draw-off, there is a water exchange in the connected loop pipe, stagnation in the domestic water installation is prevented by natural consumption. As a result, the nominal content of a bathroom is exchanged up to **100 times** a day by the KEMPER Hygiene System KHS – without wasting a drop of water – and the operator risk is comparison to conventional installation types is greatly reduced.

Temperature maintenance

Thanks to the natural water exchange in the loop pipe, the prescribed temperature maintenance can be realised efficiently. The KHS KEMPER Hygiene System reduces the water temperature by up to **5 K** in bathroom installation in comparison to conventional types of installation.

Comfort

The KHS Flow-Splitter ensures water exchange in the pipes without any noise and unnoticed by the user. This is an advantage that ensures comfort in comparison to conventional fittings, especially in buildings such as hotels or care homes.

Saving Resources

Use of the patented KHS Flow-Splitters ensure a marked reduction in flushing volumes. Up to **3 m³** of drinking water can thus be saved per year and bathroom in comparison to conventional installation types. Furthermore, remaining flushing volumes of water can be collected centrally in a cistern with the KEMPER Hygiene System KHS and used as ECO water in secondary systems.

Increase in Efficiency

The daily water exchange, which is usually much higher than a conventional series installation, is powered without additional auxiliary energy. Our patented and maintenance-free KHS Flow-Splitter is responsible for this.

What's more, the KEMPER Hygiene System KHS pays for itself due to lower investment costs in comparison to other installations, for example because there is no longer a need for a flushing device in every bathroom. Furthermore, thinner pipes can be dimensioned with the same nominal content. Together with the flushing volumes saved, this is an investment that pays for itself after just a few years. Another plus point that saves running costs: the second use of the intercepted water is available to operators as ECO water, for example for watering gardens, green roofs and green façade areas – or for flushing WCs.

Design Reliability

Correct use must always be ensured in properties such as hotels or hospitals. However, varying uses result in potential stagnation areas. This is where the KEMPER Hygiene System KHS makes the most of its unique advantages. Thanks to loop installation and KHS Flow-Splitters, natural and planned draw-offs in the overall system ensure safe water exchange, even in temporarily unused bathrooms.

And the arrangement of the installations – WC to shower or washbasin – can be chosen freely. What's more: even if usage habits change in the long term and tapping points are taken out of service, no pipes have to be dismantled to prevent stagnation. Simply sealing the connection is enough.

Operational Safety

The nominal content of a bathroom is often exchanged by the KHS KEMPER Hygiene System much more frequently than required by the law; the formation of dangerous germs is greatly reduced due to a lack of stagnation. This reduces the operator risk in comparison to conventional installation types, even in the event of unexpected changes in use.

Crisis Flexibility

The coronavirus pandemic showed us that there can often be unexpected changes in use in properties such as hotels or hospitals. Areas are closed, there is no consumption. That is a risk to drinking water hygiene. With the KHS Hygiene Flush Box or KHS CoolFlow system components, water exchange and temperature maintenance can be automated – thus ensuring drinking water hygiene even in the event of interruptions to operation.

1.	2.	3.	4.	5.
SMALL NOMINAL CONTENT	LEAN DIMENSIONS	LESS STAGNATION	LOW SYSTEM TEMPERATURES	BETTER HYGIENE

MORE OPERATIONAL RELIABILITY

We have fought for our vision. When our idea was born more than 15 years ago, the potential of the KHS KEMPER Hygiene System could barely be foreseen. Today, more than 15,000 projects prove: it makes drinking water hygiene more efficient, better and more sustainable.

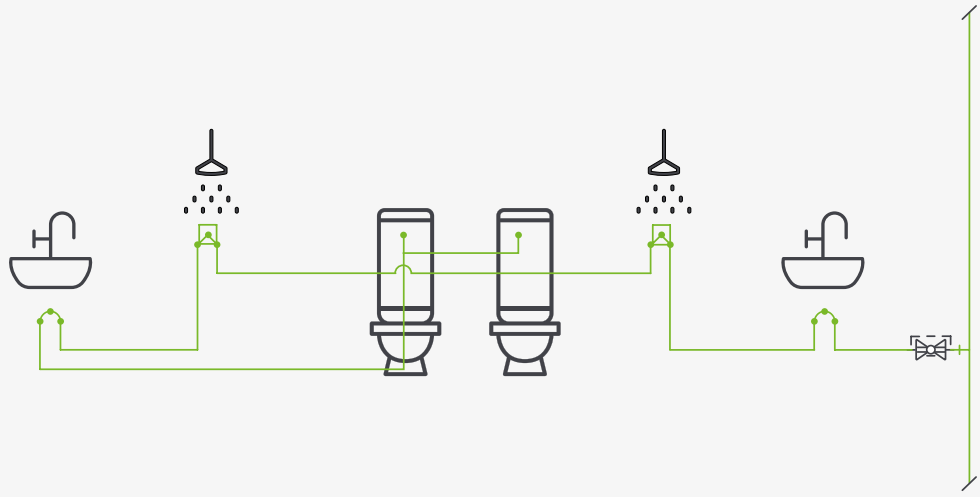
We are proud of that.

More values. One system. KEMPER KHS.

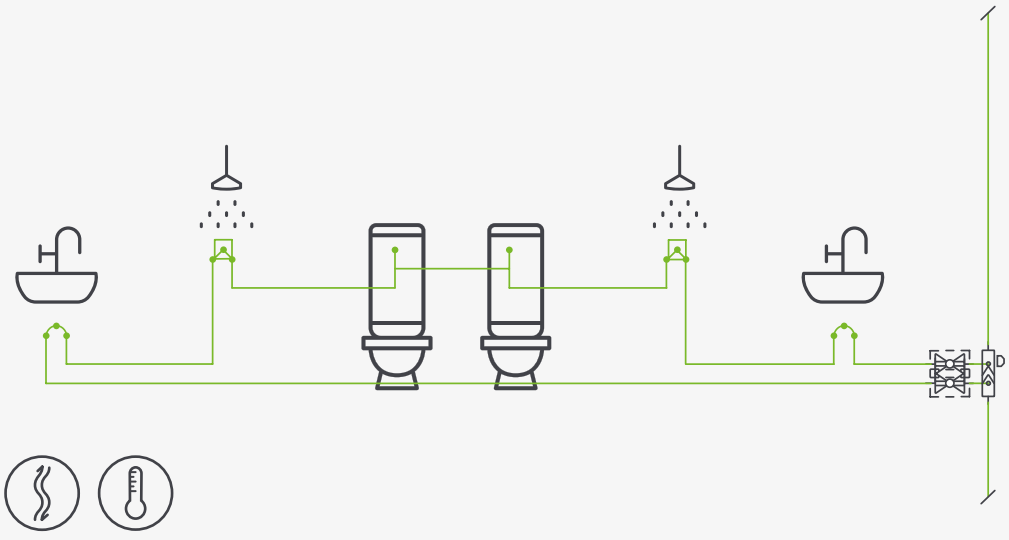
Loop installation:
the basis of optimum drinking water hygiene.

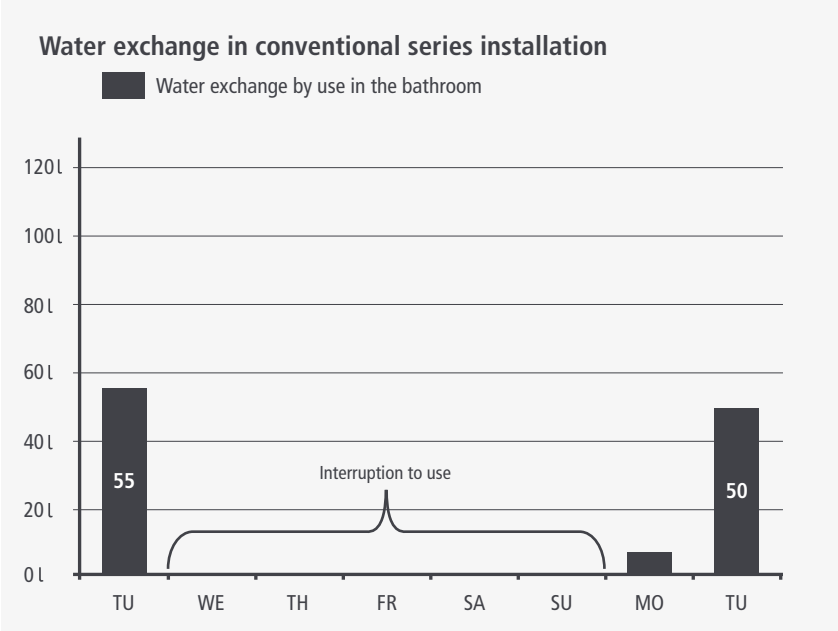
We developed the KHS KEMPER Hygiene System for buildings that are especially relevant to hygiene or have potential stagnation areas in the drinking water supply. The basis of our solution is the further development of the series installation into a loop installation. In a loop installation, the pipe is conducted back to the distribution pipe after the last tapping point and connected by our patented KHS Flow-Splitter.

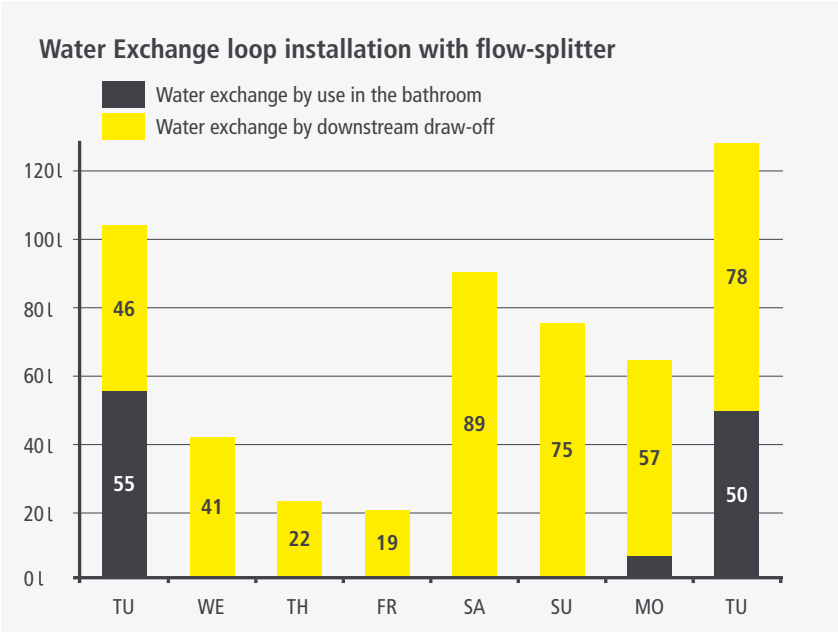
Conventional series installation



Loop installation with flow-splitter







Stagnation prevention, but conserving resources.

The effect of our further development: downstream, natural consumption ensures water exchange in the ongoing operation of a buildings, even in stagnation areas – even in temporarily unused bathrooms. With the same usage behaviours, there can be up to 100 times more frequent water exchange in the bathroom per day in comparison to a conventional series installation.

Temperature maintenance without auxiliary energy.

More than a positive side effect: thanks to the natural water exchange in the loop pipe, the statutory prescribed temperature maintenance can be realised efficiently. The use of KHS Flow-Splitters reduces the water temperature in bathroom installation by up to 5 K in comparison to series installation just due to the regularly flowing fresh drinking water.

For operators, the loop installation is the intelligent basis for ensuring a hygienic drinking water supply in the whole building.

Heart of the loop installation: the patented KHS Flow-Splitter.

The KHS Flow-Splitter is the heart of the Kemper Hygiene System KHS. It works without additional auxiliary energy, noiselessly and maintenance free. In the installation, it ensures that the water is regularly exchanged in all connected pipes – whether by means of natural draw-offs at a downstream location of by means of automated processes.

To so this, the KHS Flow-Splitter uses the Bernouilli effect: The flow rate in the main is split by a minimum pressure difference into a flow rate that goes straight through the Venturi cartridge and the other flow rate goes through the loop. Even at low flow rates in the main pipe, the dynamic Venturi in the Flow-Splitter generates a substantial flow in the loop pipe.

Another advantage of the loop installation: if a bathroom is used, the water flows to the tapping points from both sides of the loop. Therefore the pipe size of the Flow-Splitter loop can be small. That saves material and has a positive impact on maintenance of the intended temperature.

The overall installation therefore ensures water exchange several times a day in all connected loop pipes: without wasting potable water from extensive flushing measures on the otherwise many flush valves or Hygiene Flush Boxes. Bacteria growth is prevented, the potable water remains fresh, cold and hygienically pure.

INFO

> 20 academic papers

We work together with scientists: the KHS Flow-Splitter was developed together with scientists – and is supported by researchers to this day

> 15 years' experience

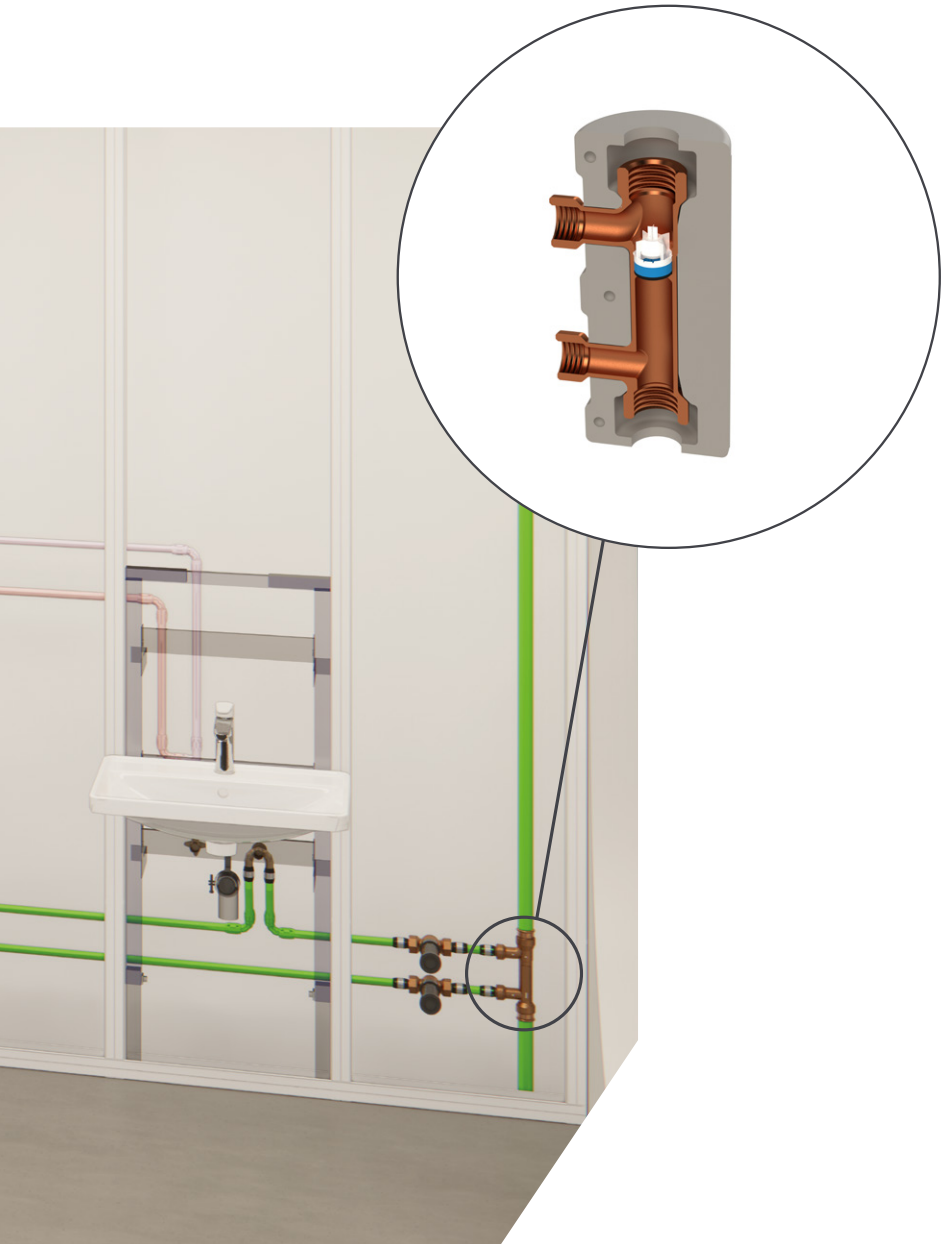
Since 2007, the KHS Venturi Flow-Splitter has used been at the heart of the KEMPER Hygiene System KHS in cold water.

> 15,000 projects

The KEMPER Hygiene System KHS: Worldwide, more than 15,000 projects have already been realised

> 55 technical papers

We are happy to share our technical knowledge – and this has been the case since the start of series production of the KEMPER Hygiene System KHS



KHS Flow-Splitters

The Flow-Splitter ensures frequent water exchange: in all pipes by means of natural consumption or automated processes – without additional auxiliary energy, noiselessly and maintenance-free.

How does a Flow-splitter work?
Scan and watch the video

Your challenges:
can be optimally solved in many ways.

Make the best preparations:
including for interruptions to operations.

To maintain drinking water hygiene, the law requires regular water exchange. Therefore, according to VDI 6023 Sheet 1, non-use of more than 72 hours is an interruption to operations that should be avoided. Reasons: the design is based on the maximum usage situation for perfect functioning. However, in practice, changes in usages, shut-downs or interruptions to operations often result in the actual frequencies of withdrawals and amounts withdrawn deviate greatly from the originally intended values. This leads to stagnating areas with inadequate hygiene.

In such cases, the KEMPER Hygiene System KHS in combination with the KHS Hygiene Flush Box, the KHS Flush Point or KHS CoolFlow – our system for active temperature maintenance – ensures correct use. As a result, the necessary water exchange and temperature maintenance can be realised safely, even in phases of interruption to operation.

KHS Hygiene Flush Box

The KHS Hygiene Flush Box automises the water exchange in the bathroom. Interval, time, volume, temperature and usage-controlled flushes are possible. The PRO, PURE and LITE versions each offer precisely the functional scope that is needed for an optimum control concept, depending on the building type.

KHS Flush Point

The KHS Flush Point ensures the use of the installation for the intended purpose by means of controlled 'forced draw-offs' as a central flush point, e.g., in the cellar. Combined with KHS control systems of the building management system, the water exchange is carried out using selectable parameters.

INFO

Too precious to be wasted:
ECO Water.

Unlike with automatic taps or cisterns with a hygiene function, the flushing volumes in the Hygiene System KHS are carried out in a central location (e.g., in the basement). As a result, the exchanged water can be caught in a cistern and not wasted down the drain.

The flushing volumes collected can be reused sustainably with KHS, especially in the summer. That saves water and costs.

More about the
ECO Water Tool

Buildings have a temperature

If you look at climate change, one thing quickly becomes clear: ever hotter summer months with rising outdoor temperatures lead to increasingly high ambient air temperatures in buildings. Simultaneously, the incoming main temperature of the drinking water also rises. The consequence of these higher heat loads is that the buildings get a temperature. Temperature-led flushing measures sky-rocket with the aim of ensuring temperature maintenance in the cold water and adhering to the statutory requirements. In conventional installations, enormous quantities of warmed potable water is flushed away – that is neither effective for preventing dangerous bacteria formation nor ecologically, never mind economically, sensible.

Climate-resilient drinking water installation

We prevent this development: with the preventative design and use of the loop installation with KHS Venturi Flow-Splitters in the building, we create the very best conditions for stagnation prevention - and also for sustainably and much more effectively ensuring temperature maintenance in cold water.

KHS CoolFlow

What's more, with KHS CoolFlow, we offer intelligent components for active temperature maintenance. With them, you also reliably and extremely efficiently counter the effects of climate change on drinking water temperature.

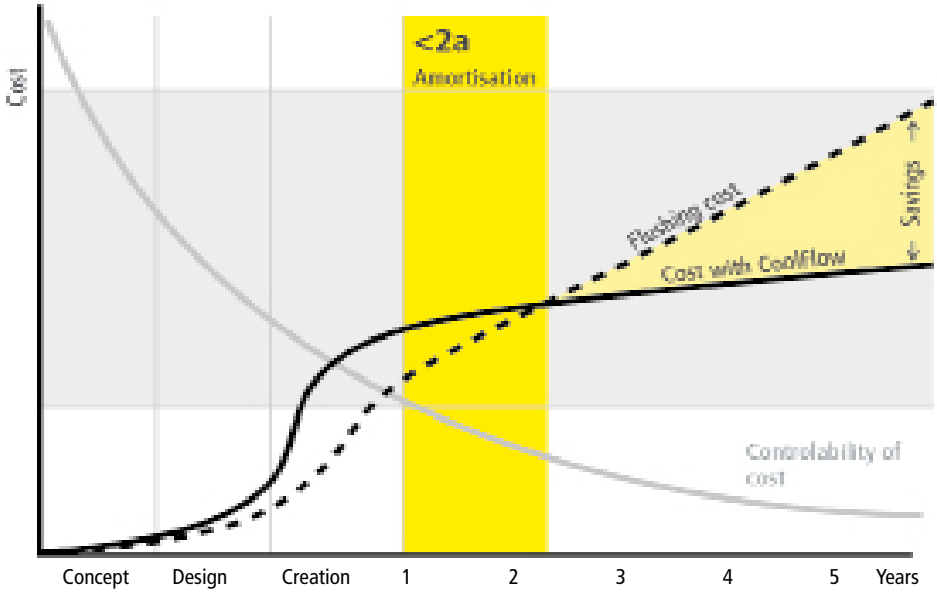
Sustainable temperature maintenance: economically predictable with KHS CoolFlow.

Our KHS CoolFlow supplements the KEMPER Hygiene System KHS with components for active temperature maintenance in cold water installations. The KHS CoolFlow cooler and thermostatic balancing valves with a working range of 15 – 20 °C are used. KHS CoolFlow thus ensures a permanent temperature maintenance below 20 °C and makes flushing measures for temperature maintenance in cold-water pipes superfluous.

What's more, the KHS CoolFlow balancing valve technology also ensures the maintenance of the water exchange requires by standards for drinking water hygiene. Because KHS CoolFlow reduces microbiological growth in the cold water circulation and the flushing volumes to a minimum. That makes economic sense because KHS CoolFlow quickly amortises itself as an alternative to temperature maintenance: the Return on Investment (ROI) from active temperature maintenance is often reached after less than two years. An economic aspect that should be taken into account right at the design stage.

In an installation with Flow KHS Flow-Splitters, the temperature can even be maintained right up to the tap connections. And the existing loop pipe system can be used for cold water circulation. In this way, Flow-Splitter installations can be quickly and cost-effectively retrofitted with KHS CoolFlow – there is no need for complex valve technology and expensive cabling right up to the bathroom.

KHS CoolFlow cooler



This is how KHS CoolFlow works

INFO

> Experience since 2019

KHS CoolFlow has been increasingly used in projects since 2019. In the Offshore sector, we have been designing and implementing project with cold water circulation systems since 2010.

> 2,000 lines in circulation mode

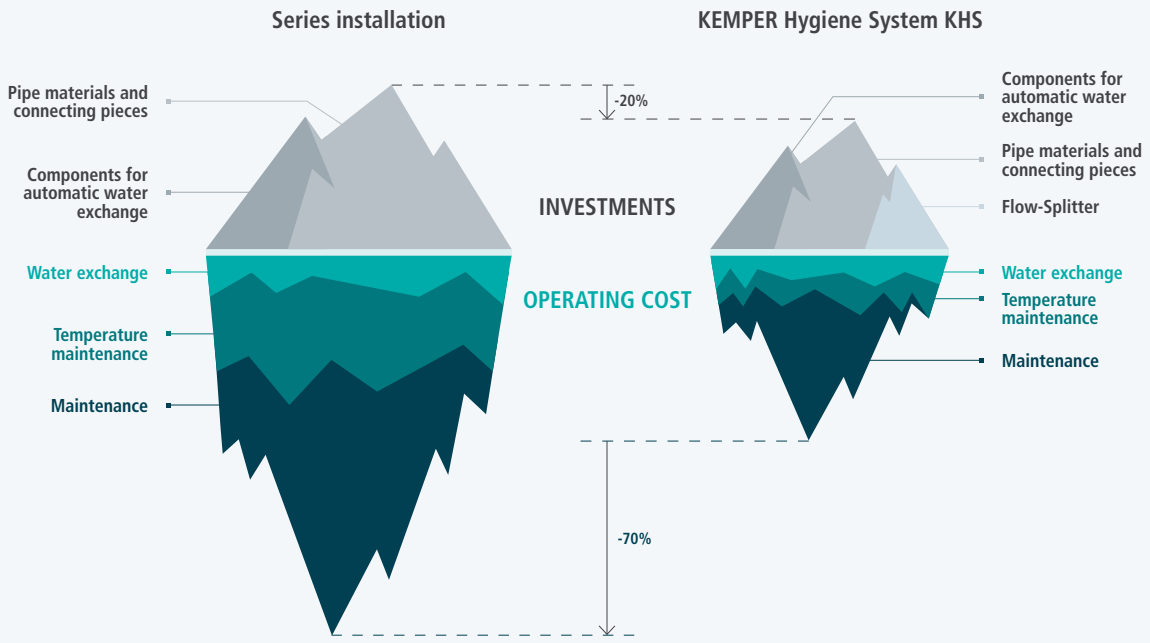
More than 2,000 lines are actively cooled by KHS CoolFlow and hydraulically balanced.

Best economic reasons: for designers, operators and investors.

No matter how important outstanding drinking water hygiene, full design freedom, resource conservation or maintenance freedom are: we know that in the end economic reasons are also decisive for which installation is put into a building.

That's why the subject of efficiency was also a priority in the development of our KEMPER Hygiene System KHS: for example, in comparison to series installation, the investment costs for the KHS with Flow-Splitter can be up to 20 per cent lower – and thus already a strong argument for our solution, alongside better hygienic properties and great operational safety. With the up to 70 per cent lower operating costs thanks to lower drinking water consumption, lower maintenance and energy costs or the use of ECO water, we offer the best reasons for designers, operators and investors. The investment has often paid for itself in less than two years.

When comparing investment and running costs, it is important for the comparison to be conducted on the same functional basis. For this reason, the components for automatic water exchange must also be considered for series installation – they are often neglected in the design phase. The same applies to the resultant operating costs.



Managing operator duties: with transparent drinking water hygiene.

The mini control system makes it easier to comply with operator duties. The control system is used to control and evaluate all connected actuators and sensors in the drinking water installation at a central point and log all of the results and operating data to prove correct use.

Monitoring of water temperatures in circulation systems, for example, ensures transparency in the drinking water installation. Furthermore, water can be exchanged in order to maintain drinking water hygiene for cold drinking water (PWC) individually for each building type. The planned water exchanges can be saved and therefore documented in a flushing log including flow and temperature as well as flushing duration.

Up to 62 control systems can be connected to the systems via CAN bus. Naturally, Hygiene Flush Boxes can also be integrated in the system. The control system is operated via the integrated display – or even more conveniently via the web interface in the internet browser.

The building management system can be connected via the standard logs Modbus TCP/IP, BACnet IP or BACnet MS/TP. This makes access to the datapoints of all of the flush valves and sensors connected possible – for example, to enable visualisation, evaluation and control of the components by a higher command level.

Win-win-win-win situation: KEMPER Hygiene System KHS.

With the KEMPER Hygiene System KHS we are revolutionising hygienic drinking water supply in buildings. With just one system we are creating more values from which everyone benefits: operators, users, designers and the environment.

As well as actively maintaining temperature, our system also ensures the water exchange required by the relevant standards. We consider every building holistically and ensure optimum provision and maintenance of drinking water hygiene with customised product solutions. And all of this is optimally predictable,saves water, is sustainable and extremely economical.

The advantages of KEMPER Hygiene System KHS in comparison to conventional installation methods at a glance:

> 50x water exchange
With the same usage behaviour, the water is renewed up to 50x more frequently

< 5 K temperature level
Up to 5 K lower temperature level in comparison to other installation methods

< 20 % investment costs
Up to 20 percent lower investment costs in comparison to other installation methods

< 2a ROI
The Return on Investment (ROI) from active temperature maintenance is often below two years

€0 maintenance costs
No maintenance costs for the KHS Flow-Splitter

Water saving per bathroom 3 m³/a
Save up to three cubic metres drinking water per year and bathroom

100% reuse of flushing volumes
Up to 100 percent of the flushing volumes can be reused as ECO water

100% noiselessness
The water exchange is completely noiseless and invisible for users

100% System knowledge
Thanks to complete system knowledge, it is much easier to fulfil operator duties

100% design assistance
Thanks to personal service, planning assistance and digital tools, the design is individual, straightforward and efficient

Personal, efficient and with expertise: this is how we support you in design.

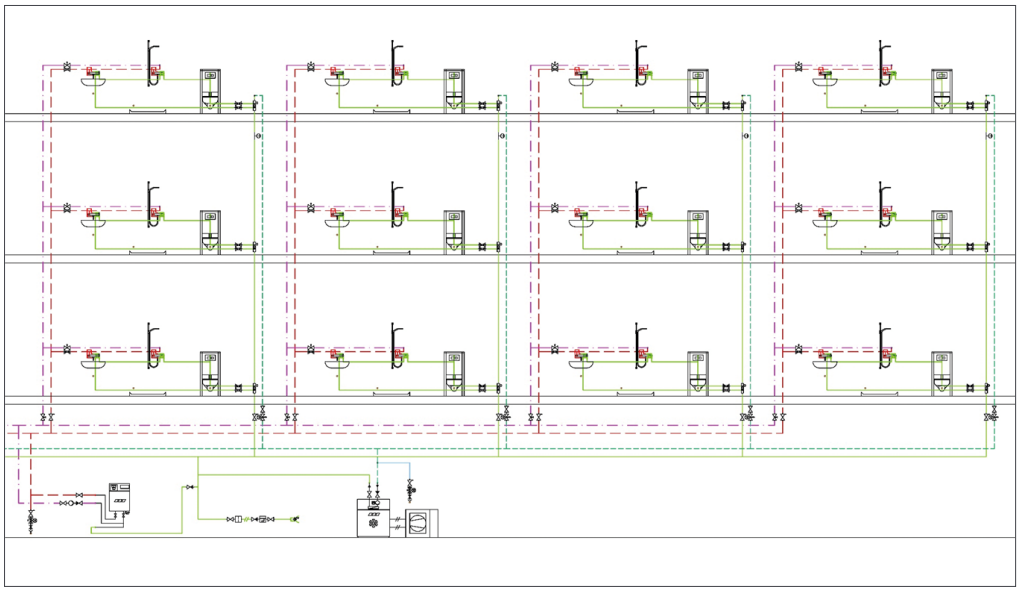
Our innovative KEMPER Hygiene System KHS is designed individually for very building and optimally adapted to the relevant challenges. A step that is worthwhile right from the design phase and quickly pays for itself economically.

Our contacts on site will be happy to support you personally and in-depth from the start of design. Get in touch with us, we are happy to help.

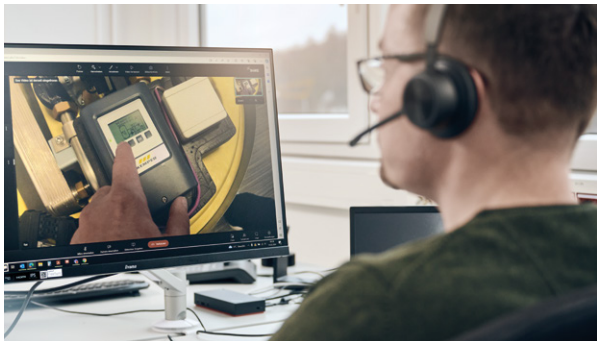
KEMPER Design Assistance KHS

We cultivate personal contact. To support our advice, we provide you with comprehensive supporting documents that make design implementation easier for you. In our KEMPER Design Assistance KHS, you will always find the right branch diagram for your construction project. The diagrams shown are directly linked to Dendrit Studio. As a result, you can amend the examples shown individually and specific to your building – a perfect solution for your design drawings and the ideal basis for your design.

You can find design examples at:
www.kemper-group.com



KEMPER services:
we give everything for your success.



Benefit from our services: quickly and directly via our digital remote services, by telephone or personally on site.

Service contacts

Do you need more information?

Find the right contact for you new on our website:

Read our references if you need any more convincing!

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