AN OPERATOR OBLIGATION DRINKING WATER HYGIENE

// Increasingly complex and large buildings mean building planners today need to pay more attention to factors such as hygiene and energy efficiency than ever before.

KEMPER

DRIVING PROGRESS

WHY IS DRINKING WATER HYGIENE THE OPERATOR'S RESPONSIBILITY?

In 2019, 1547 cases of Legionnaires' disease were reported in Germany. It is assumed that the actual number of cases is as many as 30,000 a year, however. The cause is often the building installation. When stagnation occurs, i.e. when individual installation areas are not used, the drinking water absorbs substances from the installation materials and heat from the environment. Both can lead to a change in drinking water quality that is harmful to health. A temperature rise to over 25°C is particularly alarming, as microorganisms such as Legionella multiply explosively in lukewarm temperature ranges. This is why legislators impose a particular obligation on operators of public buildings to ensure hygienically perfect drinking water throughout the entire installation at all times. This requirement poses ever greater challenges for operators due to the increasing complexity of buildings. It is therefore essential to choose the right type of installation at the very start of the planning process.

The following pages outline what you need to consider when selecting a drinking water installation.

The facts at a glance

Legal, microbiological and technical background

The legal viewpoint:

Operators of drinking water installations must comply with the relevant laws (e.g., for Germany, the infection protection law) and regulations (e.g., for Germany, the national drinking water directive from 2012) of the respective country. In particular, this means that they must ensure that the drinking water installation is operated in accordance with the applicable standards and guidelines. In order to avoid possible legal consequences, damages, fines or even imprisonment, a litigation-proof organisation should be established when planning and operating drinking water installations. This includes minimising the health risk for users and creating operational and liability security for owners and operators, for instance through protocols and operating instructions.

From a microbiological perspective:

Stagnation is probably the most critical factor in the reproduction of facultative pathogenic bacteria. Recent studies in microbiome research show that just 12 hours of stagnation are enough to cause a significant increase in the number of bacteria. In addition, nutrients and micro-organisms that have entered the water body are not removed during stagnation phases. Lastly, stagnation also has a negative effect on the temperature level in the pipe network.
The rule for PWC is: cold water must remain cold! Hygienically critical, lukewarm temperatures must be avoided in the installation.

The technical background:

Building planners must observe the following principles, which can be extrapolated from the requirements for drinking water hygiene.

// In case of comparable functionality, installation concepts that ensure a low water content should generally be preferred.
// The structural design of a drinking water installation must result in a high water exchange rate in all subsections, especially in the individual and storey supply lines.
// The water content must be minimised in a drinking water installation that cannot be maintained at the correct temperature.

Choosing the right type of installation is therefore the basis for all further measures to maintain drinking water hygiene.

Choosing the right type of installation

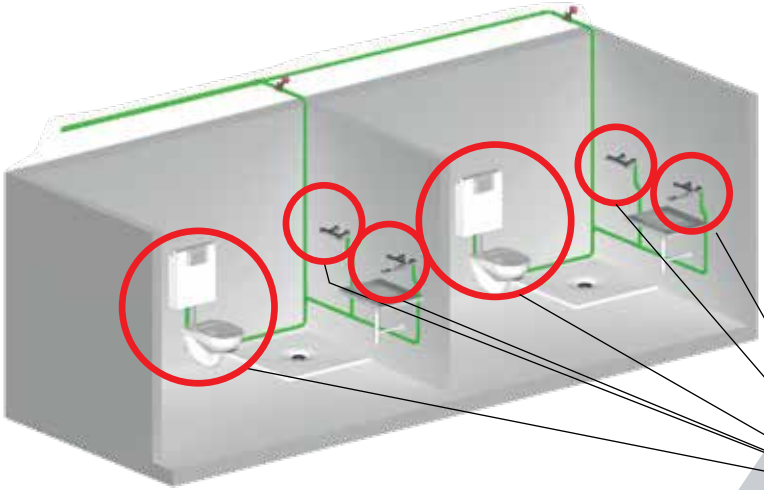
Hygienically unsuitable: T-piece installation

In many public buildings (hotels, hospitals, doctors' surgeries etc.) a T-piece installation is still often the method chosen for installing the drinking water. However, this type of installation presents operators with an enormous challenge, because, in this case, drinking water hygiene depends on user behaviour, over which the operator has no control. Users usually take only as much water as they need at any given time, regardless of whether stagnation is avoided and drinking water temperatures are maintained. The stagnation in dead legs and the critical water temperatures that result from this are commonplace and force the operators to carry out regular, ineffective and personnel-intensive flushing measures.

Temperature maintenance is impossible with this system.

High risk of stagnation!

Permanent maintenance of temperature level not possible!



3 FLUSHING POINTS PER BATHROOM

Choosing the right type of installation

Hygienically suitable: serial installation

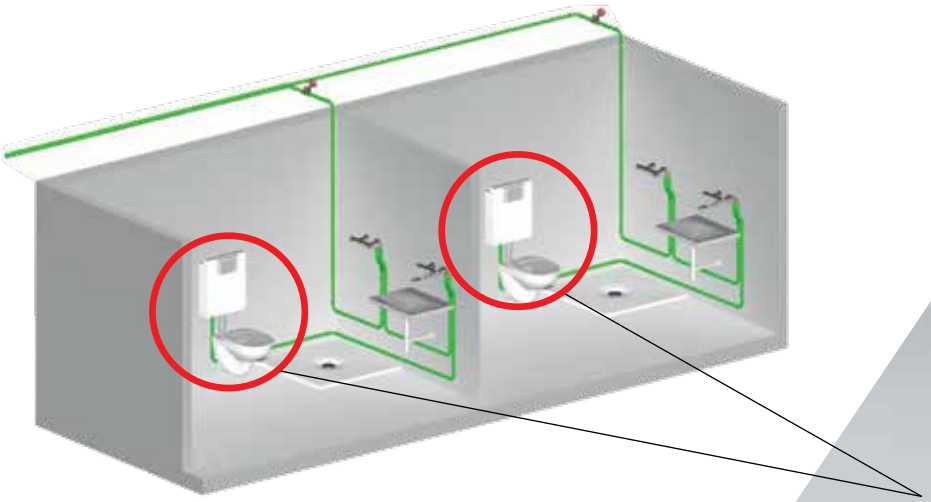
Serial installation will bring you one step closer to drinking water hygiene. In this case, the pipelines are "looped through" in the plumbing units. At the end, a regularly used consumer, such as a hygiene flush box, is placed as a toilet solution.

This solution has significant weaknesses: Although a separate automatic flushing system must be installed in each plumbing unit, it is difficult or even impossible to maintain the temperature in the cold water. In addition, users are disturbed by the need for frequent flushing. This is a loss of comfort that may not be acceptable in hotels, hospitals or nursing homes, for instance.

No risk of stagnation!

BUT

Permanent maintenance of temperature level not possible!



1 FLUSHING POINT PER BATHROOM

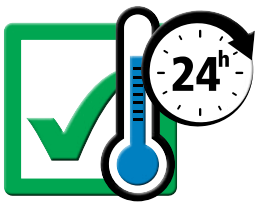
Hygienically beneficial: ring installation with dynamic flow splitters

In a ring installation inside the plumbing units, the KEMPER Hygiene System KHS connects the start and end of the loop pipe to the distribution line via a flow splitter.

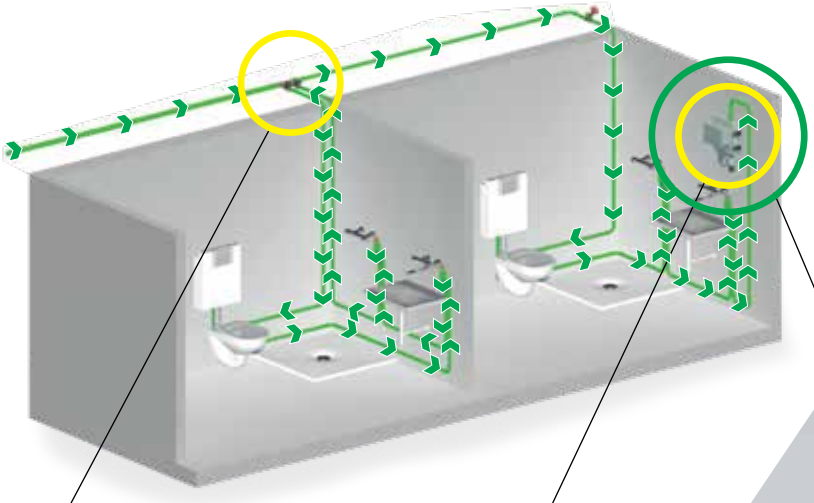
The use of a flow splitter has a significant advantage. During normal operation, it ensures water exchange in the connected plumbing unit simply by removing water from any subsequent tap.

During operation, water is exchanged in this way even in plumbing units where no water is taken. Working economically and sustainably, the KEMPER KHS Hygiene System enables the ring installation to effectively prevent stagnation with only one automatic flushing device at the end of the floor. In this way, every stakeholder, from the building planner to the installer and operator, and all the way to the end user, is offered maximum safety and security.

No risk of stagnation!



Permanent maintenance of temperature level possible, as flushing measures take place unnoticed by the user.



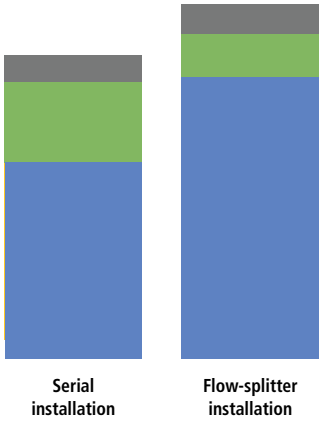
KHS Venturi
Flow-Splitter
-dynamic-

KHS Hygiene
Flush Box

PER 1 FLUSHING POINT FLOOR

Serial installation vs. flow-splitter installation

Planning example: six-storey hospital



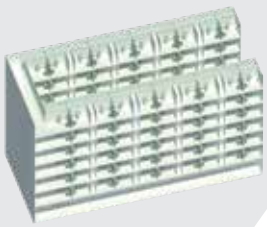
Comparison of pipe network lengths in metres per dimension

Although the flow-splitter installation has a greater overall pipe length, the proportion of large-dimension pipes is much smaller. The smaller pipe and fitting dimensions mean reduced investment costs. In addition, flow-splitter installations have better hygiene parameters.

THE FACTS AND FIGURES

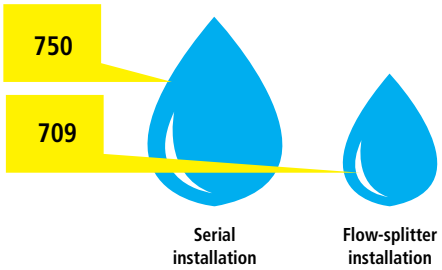
Planning example: six-storey hospital

- // an ascending shaft to supply the plumbing units
- // two hospital wings
- // per wing and storey: 10 plumbing units
- // 60 double plumbing units on 6 storeys = 120 plumbing units



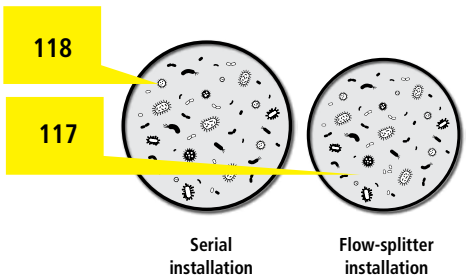
Water content in litres

In comparison to the serial installation in the planning example, the flow-splitter installation requires over 41 litres less water content. This means that the water content is exchanged more quickly with the same use.



Inner surface in square meters

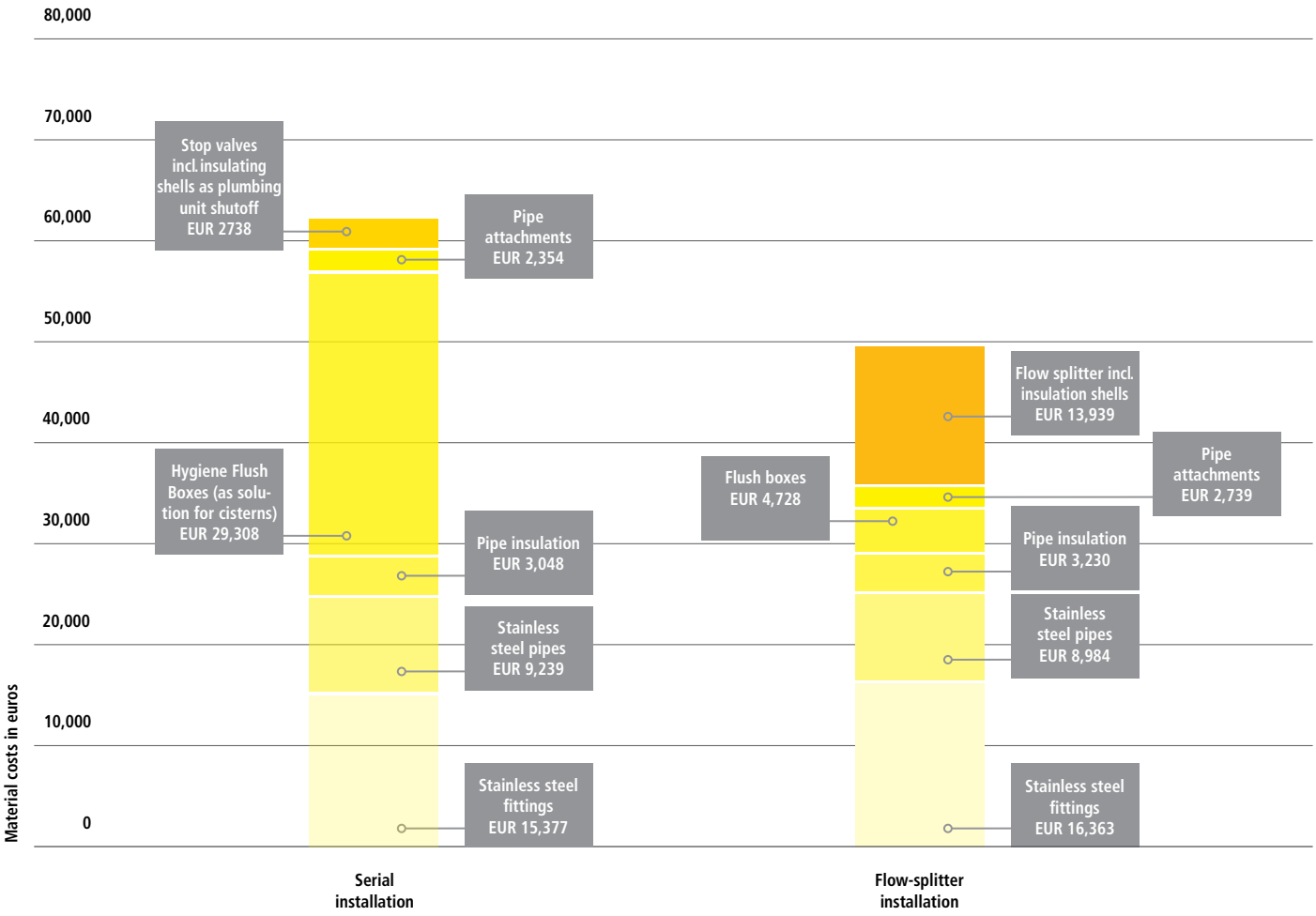
Although the flow-splitter installation has a longer pipework length, the total inner surface area available to be colonised with biofilm is one square metre smaller than that of a serial installation.



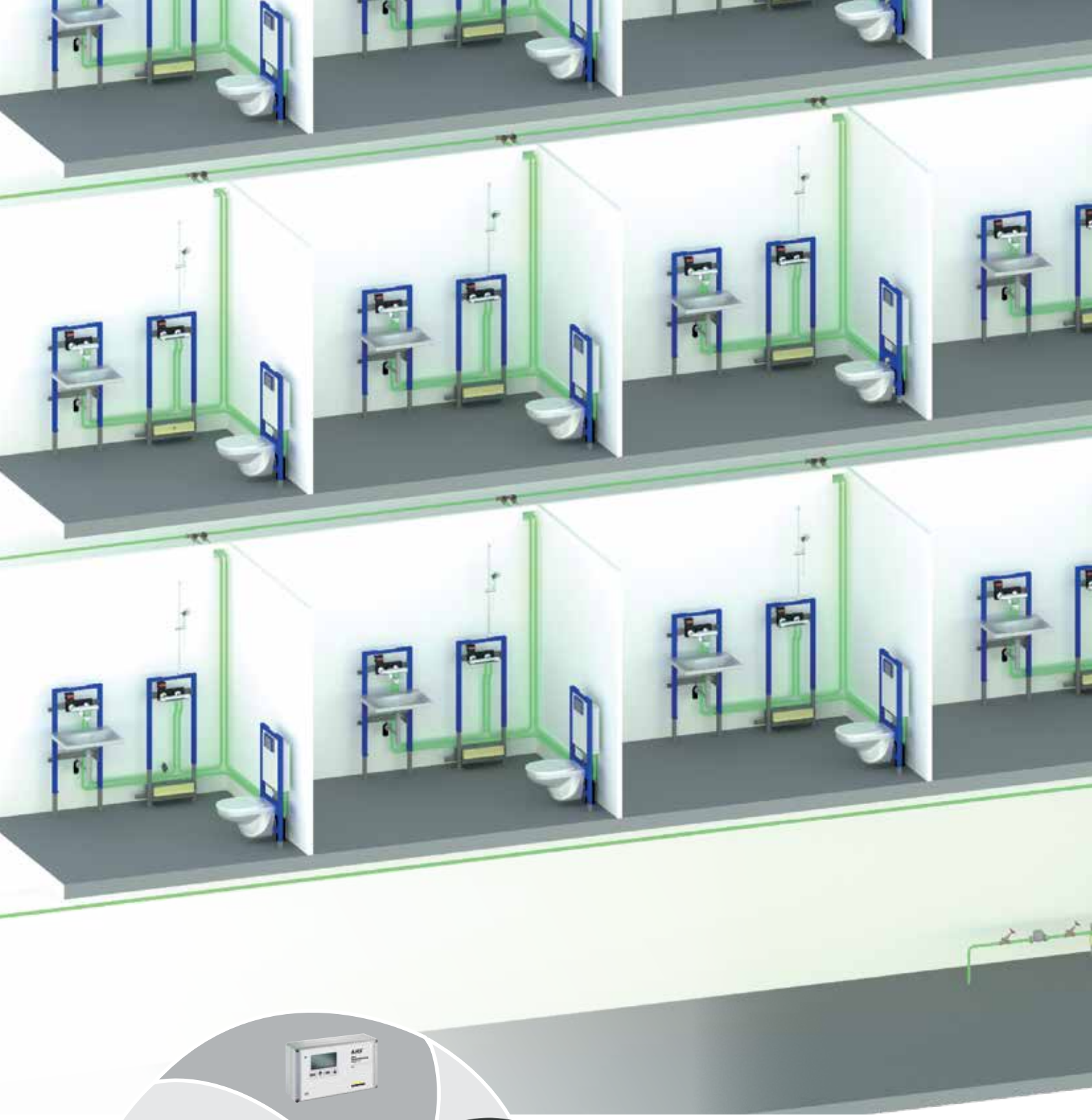
Comparison of investment costs

When a flow-splitter installation is compared to a serial installation, it is not only the hygiene parameters that are better. The investment costs also offer a savings potential of approx. 20%.*

- Flow splitter incl. insulation shells
- Stop valves incl. insulation shells as plumbing unit shutoff
- Fastenings
- Flush boxes
- Pipe insulation
- Stainless steel pipes
- Stainless steel fittings

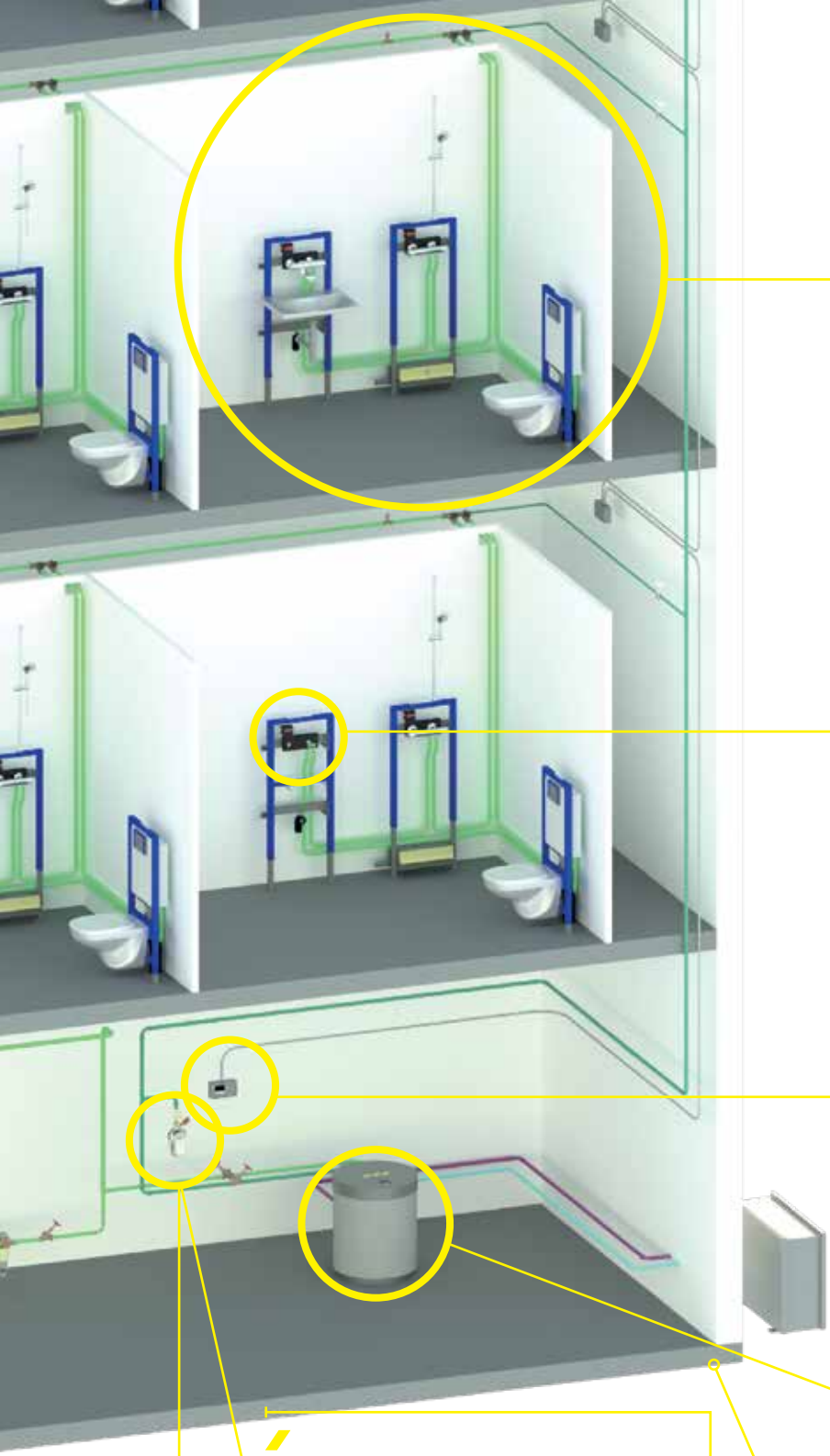


* The calculation performed with real object conditions can be requested as a Dendrit *STUDIO* file at **khs-vergleichsrechnung@kemper-olpe.de**.



KEMPER Hygiene System KHS

Safety, simplicity and sustainability –
every benefit at a glance



IT'S ALL EASY

Simple, clear pipe network structure with no branched pipes, hydraulically straightforward: one plumbing unit – one flow splitter – one nominal ring size – no potential for error.

IF USAGE HABITS CHANGE OVER TIME

If a tap is taken out of service, e.g. due to a change of use, the connections can simply be sealed with plugs. The pipelines do not have to be dismantled.

BE ON THE SAFE SIDE LEGALLY TOO

Storage of all operating parameters for documentation of use as intended.

FLUSHING STRATEGY MADE EASY

Centralised flushing station ensures a water exchange in all installation areas.

EVEN IF YOUR BUILDING HAS A "FEVER"

Effectively and safely defuses internal and external heat loads.

IN CASE OF EMERGENCY

Thanks to the centralised flushing points, the entire pipe network can be easily disinfected.

TARGETED PLANNING FOR SUSTAINABILITY

KHS makes a significant contribution to the protection of drinking water resources.

KEMPER

DRIVING PROGRESS

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