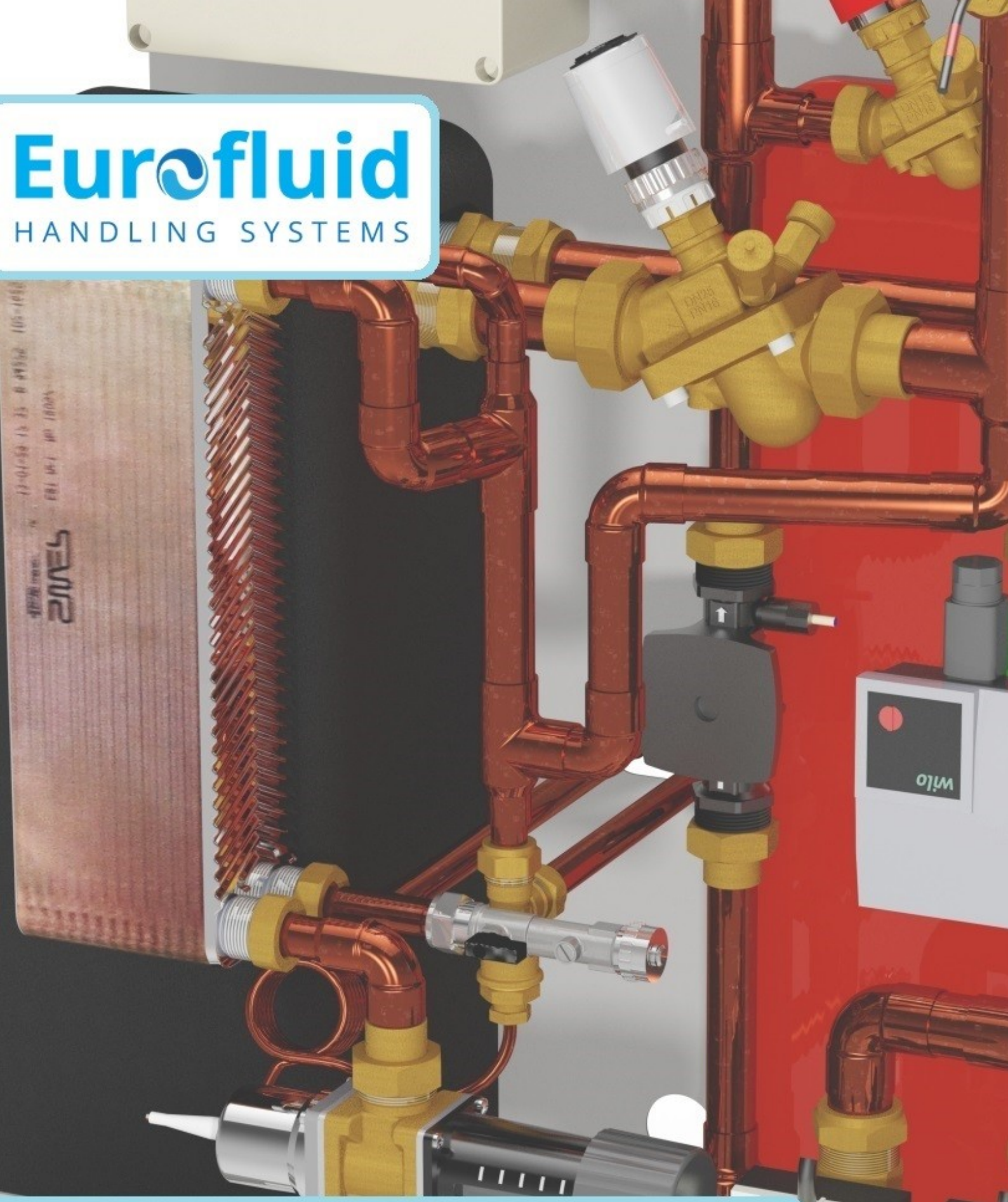
Eurofluid
HANDLING SYSTEMS



INNOVATIVE *HIU* PRODUCTS

INTELLIGENT HEAT INTERFACE UNITS

www.euro-fluid.com

Eurofluid Handling Systems - Unit 12 - The West way Centre - Ballymount Avenue
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Solving the Problems

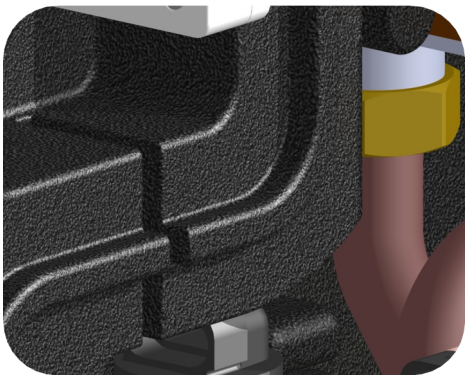
Probably the biggest problem with HIU and district heating in general is the heat losses !!!

In order to ensure that hot water is available without delay all HIUs draw a trickle flow of hot water from the primary supply to overcome heat losses and in nearly all cases this runs continuously.

The implications of this continuous heat loss is most keenly felt in properties fitted with prepay systems where the user can find their remaining credit drain away needlessly when the property is unoccupied. The designers at Thermal Integration have focused a great deal of effort ensuring every possible step is taken to solve this key problem.

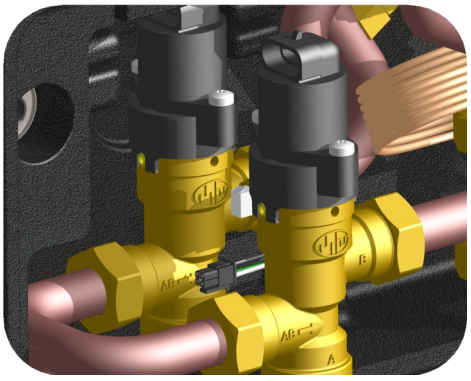
Moulded EPP Insulation

One way to reduce the rate of heat loss is to insulate. The range of Thermal Integration HIUs make use of highly engineered EPP Expanded Polypropylene moulded enclosures that encase individual components supporting assemblies and preventing any heat bridging to the environment Heat losses of under 2W are available making the drain on energy use less than 1 pence per day.



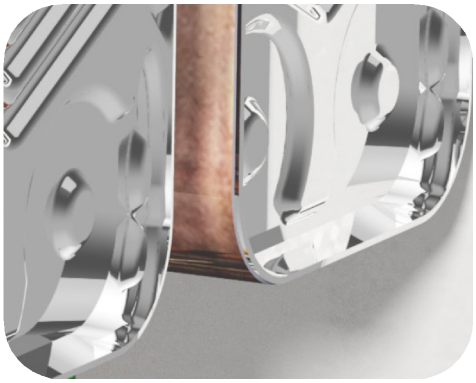
Economy Mode

Another way to reduce losses is to allow the system to go cold when not in use The range of electronic HIUs provide an optional Economy Mode whereby the HIU will go cold after one hour of inactivity significantly reducing energy consumption further Sterilisation cycles ensure that the system is never left cold for extended periods to prevent a build up of Legionella bacteria.



Advanced Heat Exchange

The final way to reduce heat losses on the district system as a whole is to run the network at lower temperatures typically 65C flow and 35C return with very low temperature drop across the plates. Multi-pass heat exchangers are used to ensure these types of temperature drops can be achieved while maintaining turbulent flow across the range of outputs.



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Key Features

Return Temperature Performance

Low primary return temperatures are important on district heating systems for three big reasons:

1. Efficiency of heat generation - CHP, condensing boilers and heat pumps all benefit greatly from lower return temperatures.
2. Heat losses - colder return pipework results in lower network heat losses.
3. Pipe and pump sizing - sending hot water back to plant is a waste of available pipework capacity, and greater loads can be transmitted through a network if the overall temperature drop is greater.

The task of achieving low return temperatures is made difficult by the need to maintain high enough temperatures in pipework to respond to immediate DHW demand. This function, referred to as a keep-warm or trickle flow, needs to also satisfy a Legionella duty of care, ensuring water does not remain at low temperatures for lengthy periods.

Metering Accuracy

In September 2015, DECC published an extensive report into heat meter accuracy. Some of the findings make some interesting points about the potential inaccuracy in metering caused by meter sampling times relative to short cycle periods on an instantaneous hot water system (combi and HIU).

An EST report (Gastec, 2008) concluded that the relatively slow response of the particular meter used caused errors of up to 34% when metering a standard hot water draw off sequence on condensing boilers. A similar study in Denmark found that excessive integration times are found to produce errors of up to 30%, again when measuring hot water use in apartment buildings and institutions (Bohm, 2013).

The inaccuracies are caused by rapid changes in temperatures, missed by the meter samples. A poorly controlled keep warm cycle on an HIUs can introduce the constant on/off cycling and changes in temperature that create such inaccuracies, although the published results fall short of an analysis of keep warm modes in HIUs.

Electronically controlled HIUs such as the DATA, DIGI and SLIM, do not introduce any temperature fluctuations during keep warm mode, overcoming potential inaccuracies.

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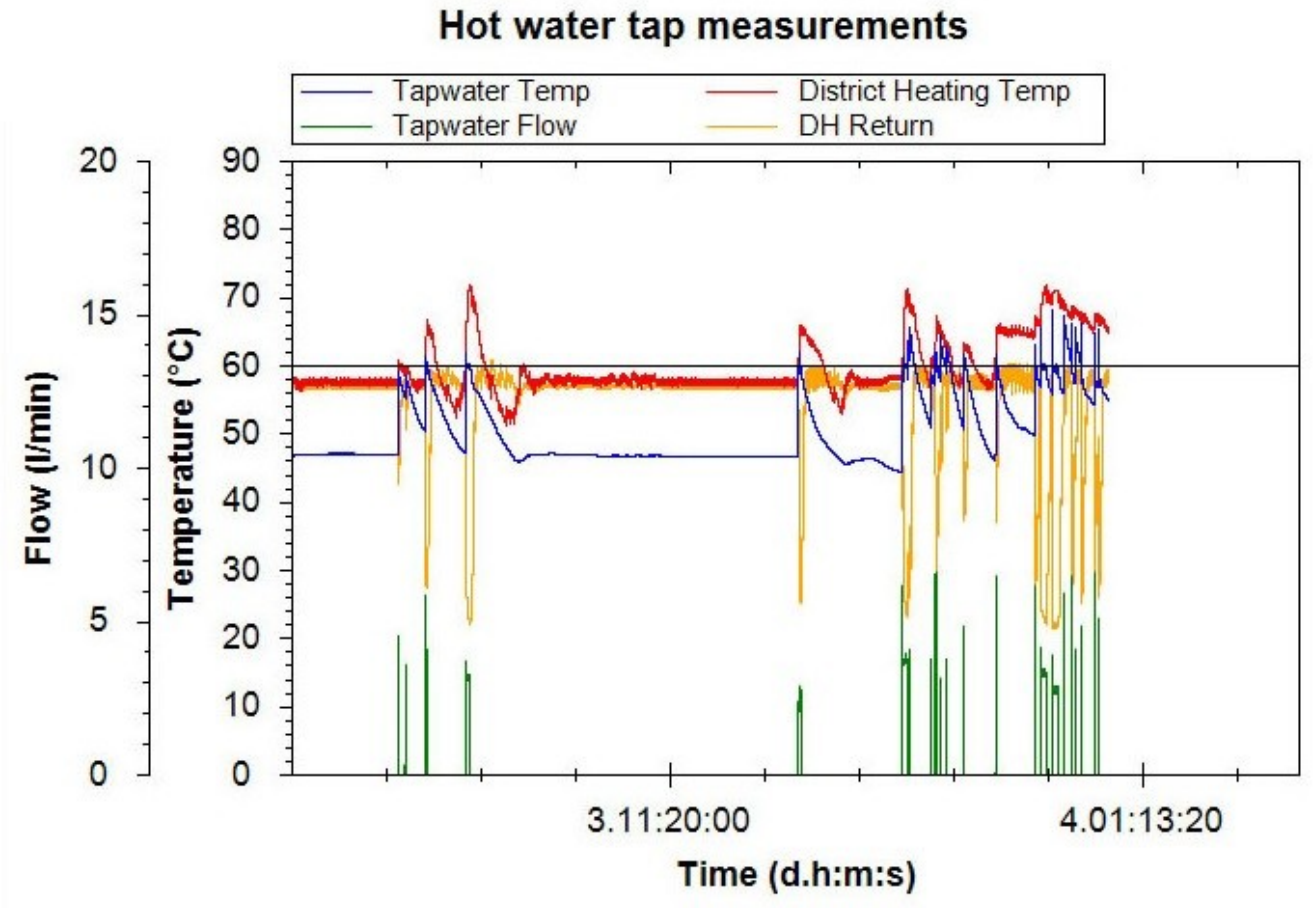
Electronic Technology Vs Mechanical Technology

Electronic Technology

Electronics make advanced control simple, and very reliable.
An electronic control system has the ability to work out the average losses from the pipework and combine this information with the system temperatures to accurately control average flow through the PHE to perfectly match heat losses.
Electronic systems are also much simpler - with only one control valve (that can be exercised) to perform all functions, where a decent mechanical system would require temperature control valve, differential pressure control valve, return temperature limitation valve, and possibly a separate thermal by-pass valve to achieve arguably comparable performance. Each valve different, requiring space, cost, spares, and introducing extra possibilities of a wrong setting that inadvertently destroys return temperature performance.
The graph below probably best highlights the benefits of an electronic system over any other when it comes to return temperature performance. As you will see, the return temperatures to the heat network remain as low as possible at all times. Even in keep warm mode, between draw offs, the system manages primary flow to ensure the return temperature does not fluctuate, and stays below the DHW setpoint.



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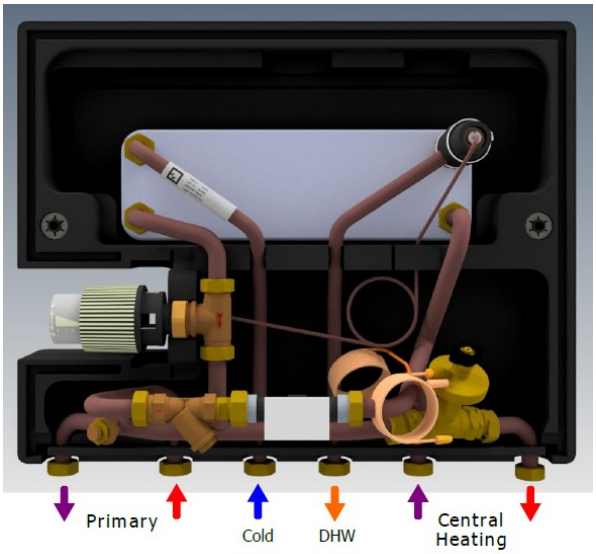
Electronic Technology VS Mechanical Technology

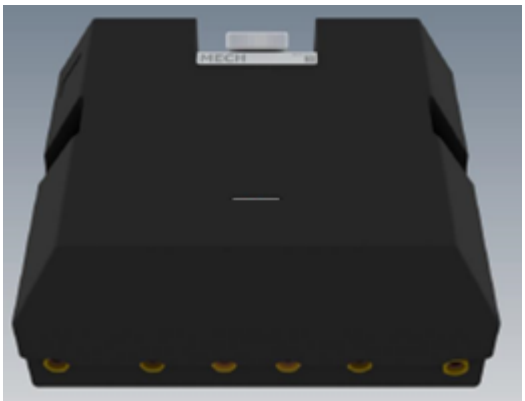
Mechanical Technology

HIU technology using mechanical controls relies on valves been manually setup (and ideally locked) at settings that meet both load requirements, while maintaining low return temperatures. The least efficient (and hence most costly to the user in terms of energy costs) is to use a by-pass that passes a low flow rate of hot water from the flow to the return.



The fixed flow must as a minimum cover HIU and pipework losses and results in return temperatures similar to flow temperatures. Across a whole site, where 95% of units are not running taps at the same time, the majority of return water to plant will be bypass flow, destroying return temperatures.

A thermal bypass, or use of a mechanical temperature control valve on the DHW, relies on the sensor loosing temperature to open the valve and allow a small flow of water through. As with nearly all mechanical control loops however, the valve characteristics and rate of sensor response to changes in primary flow and temperature makes a massive difference, and it is normal to see cyclic reheating rather than a steady very low flow equal losses.



As soon as the smallest cycle is introduced into a mechanical system, the control valve will close in response to higher temperatures. Given heat losses of pipework are greater than the plate heat exchanger (a solid insulated thermal mass), by the time the DHW sensor (mounted into the PHE) has cooled enough to
open, the pipework is considerably cooler. As this colder water then enters the PHE, the valve opens further. Flow increases until heated primary water reaches the PHE, and continues (now with very hot water flowing fairly rapidly from flow to return) until the sensor react - up to 30 seconds later.
The system overshoots until the sensor again closes the primary valve in response to the elevated temperatures and the cycle continues. The vast majority of flow through the system is at temperatures far higher than is required to maintain losses, and the rapid fluctuations in flow and return temperatures can influence heat meter readings.

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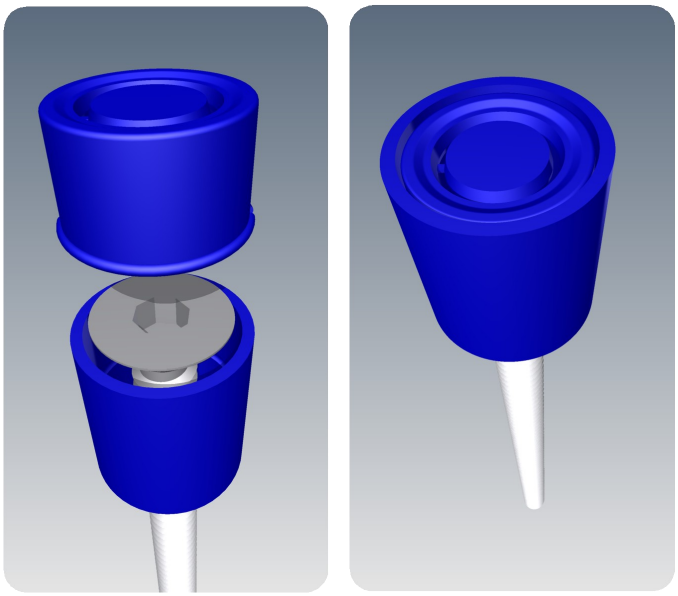
HIU Security

Security Clips

To simplify the process of securing bolts and access points on HIUs, we make use of unique moulded security clips and caps that once assembled, makes it impossible to access a bolt head or connection nut without breaking the cap.



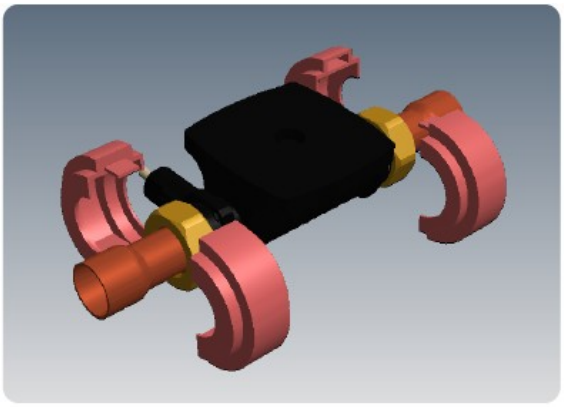
To secure casings, and any bolted on components that one would like secured, we use a Bolt Security Cap.
Bolts are inserted through the lower part of the security cap assembled, and screwed into position.

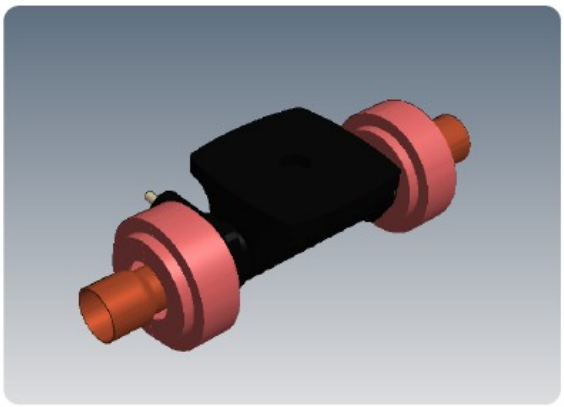
The upper part is then pushed into the lower part until it locks, at which point the cap cannot be removed, and the screw head cannot be accessed.

Heat Meters Security

Components such as heat meters and security valves require security measures to be fitted to the pipe work connections, to prevent their removal from the system without trace.

The Meter Security Clips come in various sizes and provide a permanent security fixing that prevents access to connections without breaking the seal permanently.





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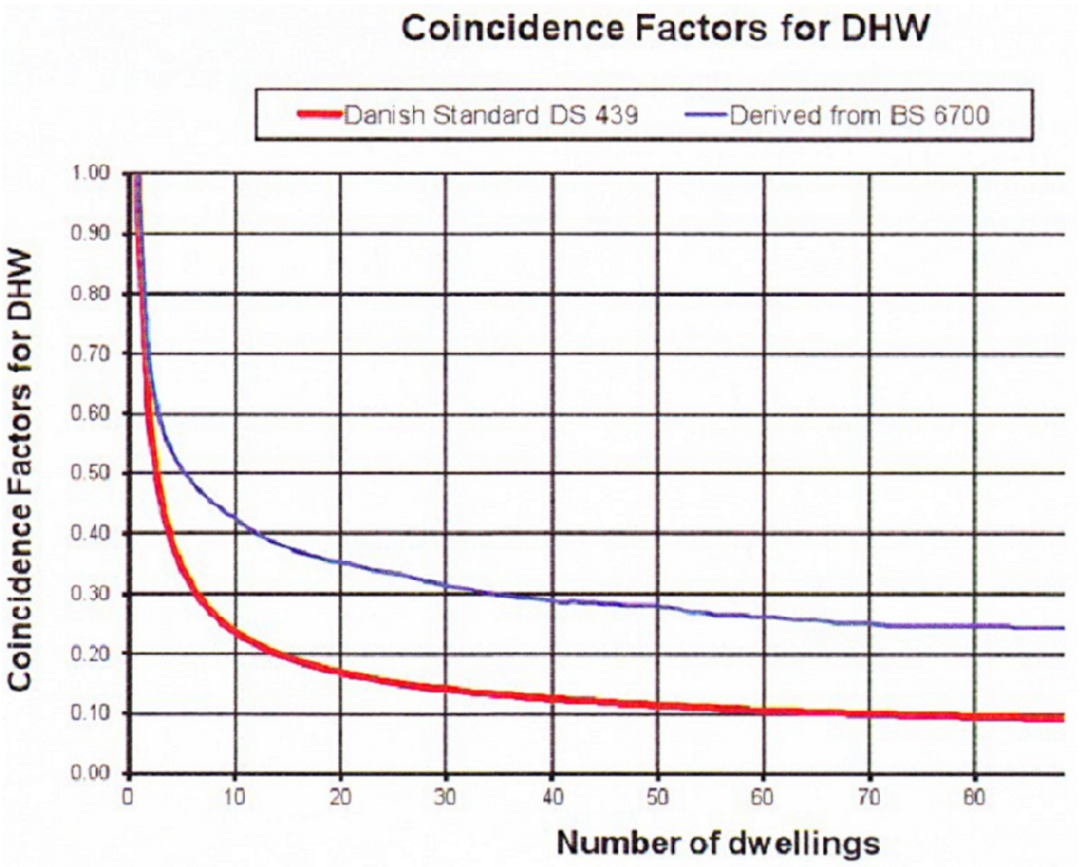
Calculating Diversity

Diversity, or coincidence factor, is a description of the probability of taps running at the same time, and as such is used to size the peak demand on a system. There are a number of standards describing the diversity that should be used for various numbers of properties, and more recently there is an increase in the number on monitored systems contributing data to a public data set upon which to base diversities.



Diversity decreases as the number of properties increases. With only a couple of properties there is a high likelihood that most taps, will be run at the same time at some point, so a diversity near 100% would be used. By the time you get to ten properties, the diversity drops to around 30%, as the probability is lower. Its a bit synonymous to working out how many heads you may throw in a row when tossing a coin.

Its quite likely to get two or three in a row, but ten is far less likely. Data from sites can show diversities over larger sites in the region of 3%. It is important to look, however, at the type of occupancy. If the properties are attached to conferencing facilities where there is a good chance all the occupants will be setting their alarm clocks at the same time, diversity may be significantly higher.

The approach of designing with a diversity higher than reality, to be safe, leads to oversized pipe work and plant, increases heat losses, and increases running costs. It has more of a negative impact on user satisfaction than if the system was sized more to the limits, and ran more efficiently. If diversity is worked out lower than it really is, then at times of peak demand, there is more chance of those extra few outlets running that take the system beyond its capabilities, and outputs will under-perform.

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Why should you pick *EuroFluid* for supply of HIUs ?

There are some 40 manufacturers of HIUs, some have ruled European markets for decades where district heating has been more common, and some are big boiler companies with superb reputations in the supply of gas boilers.

Lets have a closer look, a check list:

Do they have decades of experience in HIUs and district heating ?
Advice from professionals with over 120 years experience is important in assisting with design to help, avoid common mistakes, identifying potential problems, being an advantage over the suppliers.

Are the HIUs controlled electronically ?
The importance of this can't be understated, as it is impossible to obtain low return temperature performance or introduce sterilisation cycles without it. This will rule out all but a mere handful.

Do the HIUs have moulded EPP (Expanded Polypropylene) casings to cut heat loss ?
Preventing unwanted energy use is absolutely essential on heat networks, especially when you have prepay billing systems with shut-off valves, or modern insulation levels.

Can they supply HIUs for a variety of applications ?
This may include HIUs in fibre glass cabinets for external use, or high output models for commercial units.

Do they have Irish based production facilities with the ability to work specials ?
Not critical, but it overcomes snags and incompatibilities, with billing systems for example, local solutions for non-standard applications and billing solutions to suit local regulations.

Do they have close relationships with Irelands technologically advanced consumer driven billing companies.

Can they offer alternatives to standard supply and can they incorporate storage systems where required?

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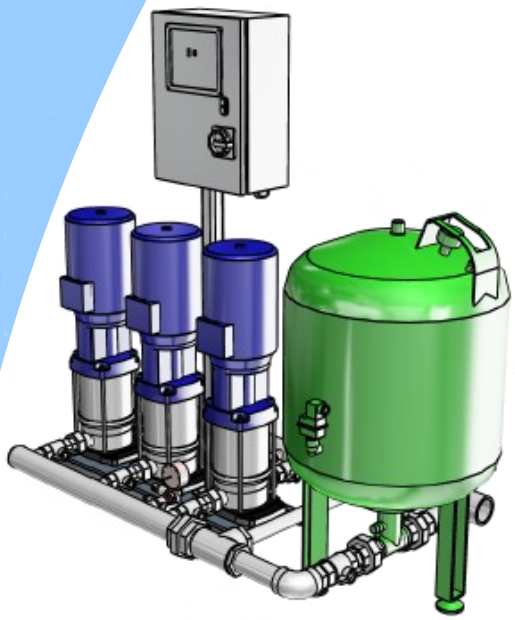
Eurofluid Centralised Plant Solutions

ACV Prestige Condensing Boiler Range

- √ 316 Stainless Steel Heat Exchanger
- √ 50-120kw in single unit
- √ Up to 920 kW in Cascade
- √ SEAI Triple Approved



EUROPAK EXEflexx Variable Speed Booster Sets

- √ WRAS Approved - as a full set
- √ No operational dependency on "Master" pump or main micro-processor
- √ Anti Legionella Expansion Vessel
- √ Anti Legionella Curved Manifold Ends eliminates

ADISA ADI CD Condensing Boiler Range

- √ 316 Stainless Steel Heat Exchanger
- √ Up to 950kw single unit
- √ Most Compact Boiler on the Market
- √ SEAI Triple Approved

Please for more info check our website: www.euro-fluid.com

Or contact us at: info@euro-fluid.com