kamstrup

Solution description

Heat Intelligence

The state-of-the-art solution for fact-based decision-making and asset management of your distribution network.

Contents

Continuous monitoring of your distribution network

Heat Intelligence is a web-based analytics platform that provides unique insight into your distribution network. It combines facts about your pipe network (pipe length, dimension, insulation, etc.) with data from your smart meters to create a detailed view of what goes on in your distribution network.

The platform is automatically updated and recalculated daily with the latest data from your network and provides a dynamic tool for continuous monitoring.

Main benefits of using Heat Intelligence

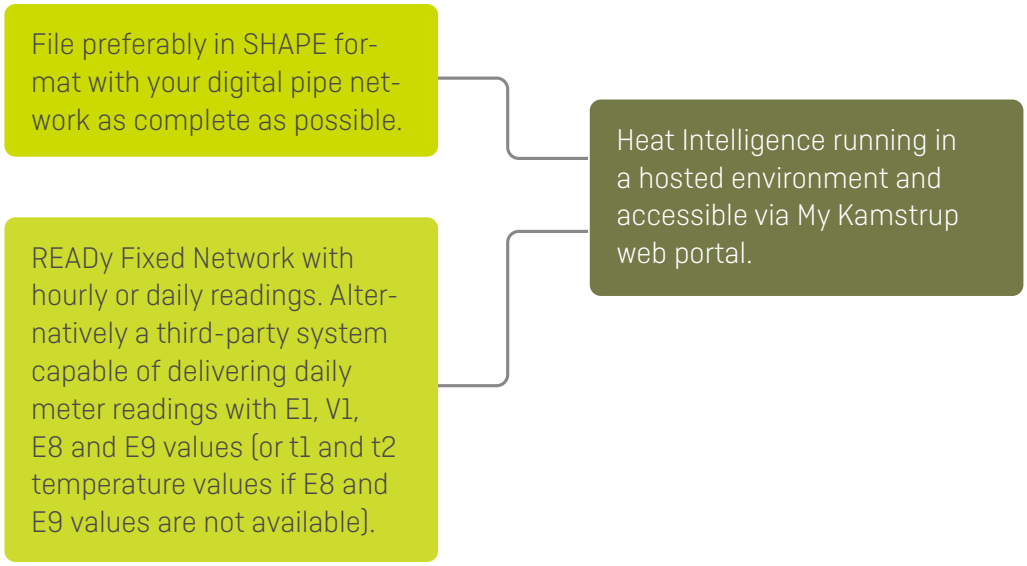
With data-driven asset management, you are able to make decisions and create action lists based on up-to-date facts, rather than habits and assumptions, and thereby reduce both operational costs and long-term investments.

More specifically, Heat Intelligence enables you to:

- Operate closer to the limits and document your quality of delivery.
- Locate important heat losses and find leakages.
- Find bypasses and analyse their impact on system performance.
- Monitor load and capacity and identify what stresses your network.

Solution components

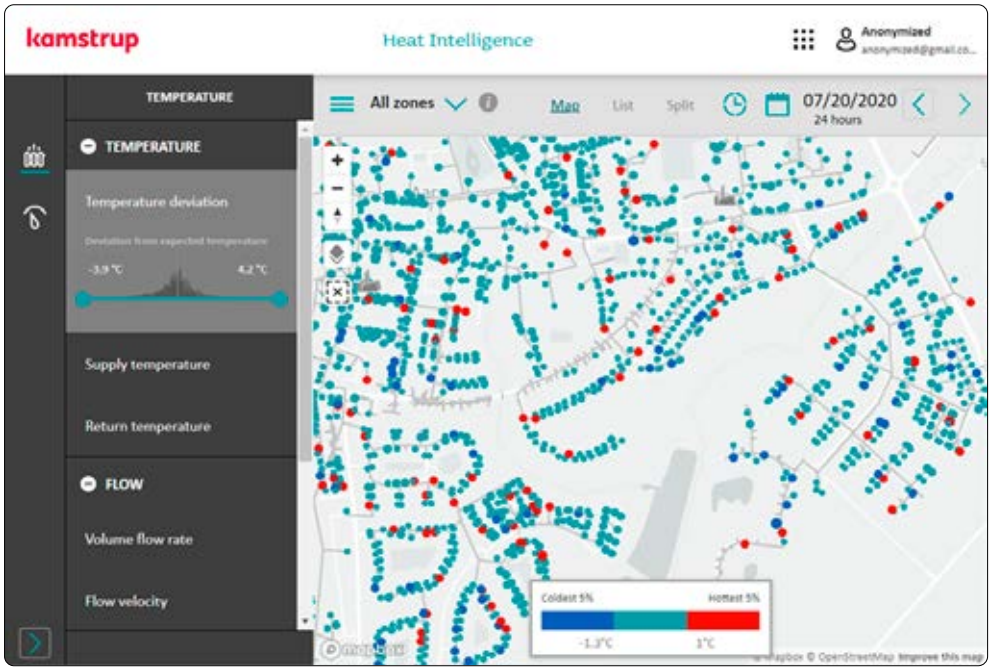
Heat Intelligence requires a file with your digital pipe network and hourly or daily meter readings that include the E1, V1, E8 or E9 registers (or alternatively t1 and t2 temperatures if E8 and E9 are not available). No additional sensors in the field are required.



Based on the information about your pipe network and data from your meters, Kamstrup creates a digital twin of your distribution network where temperature and flow data on pipe sections are calculated values whereas meter data are actual values from your meters. In fact, Heat Intelligence calculates exactly how heat travels throughout your infrastructure and what this means for your heat supply.

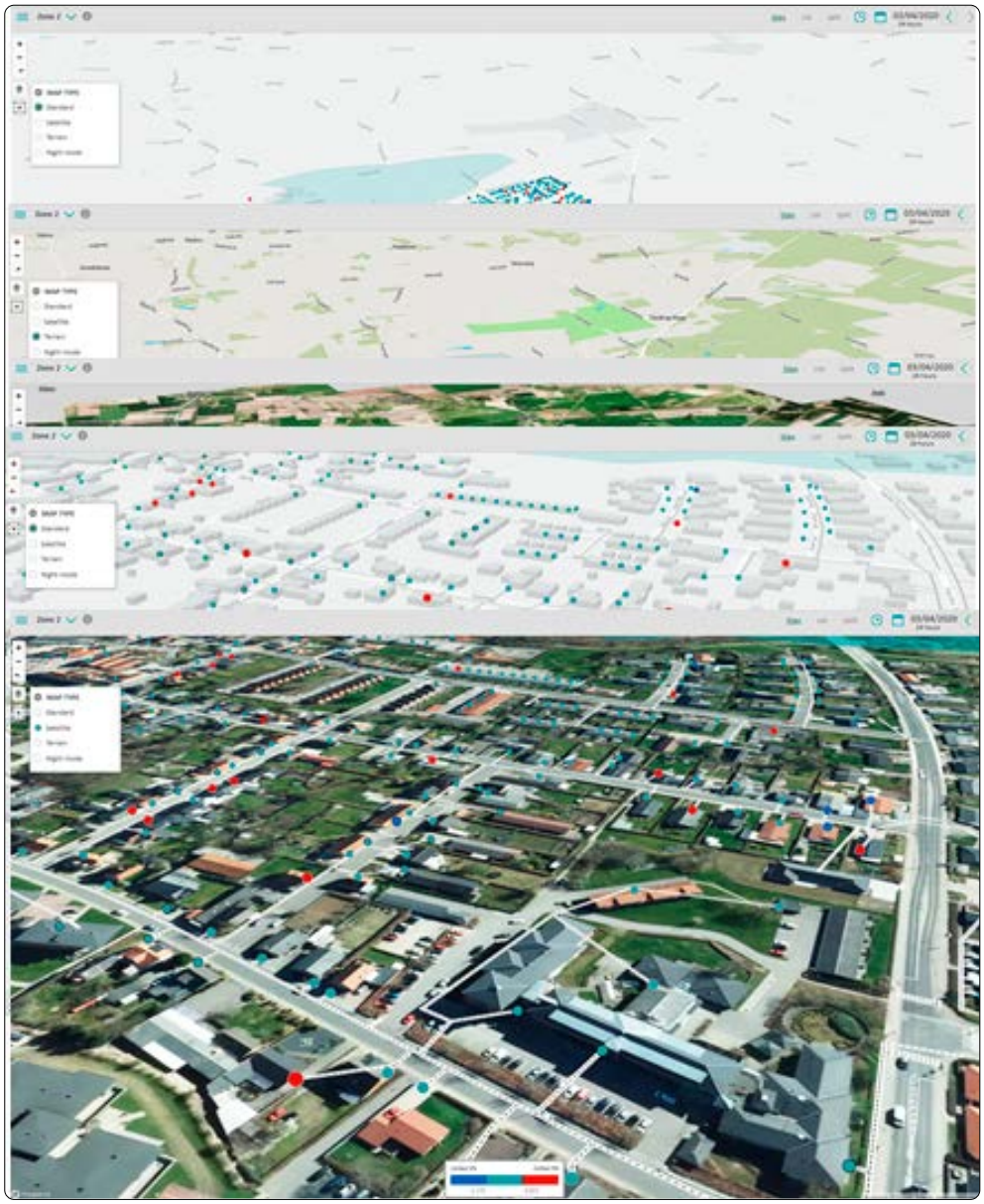
Presentation of data

An interactive map of your distribution network is used for visualising your data in an intuitive way. Pipe sections are represented by lines and consumers are represented by dots. Colours are used to quickly identify the trends, outliers and patterns in your data:

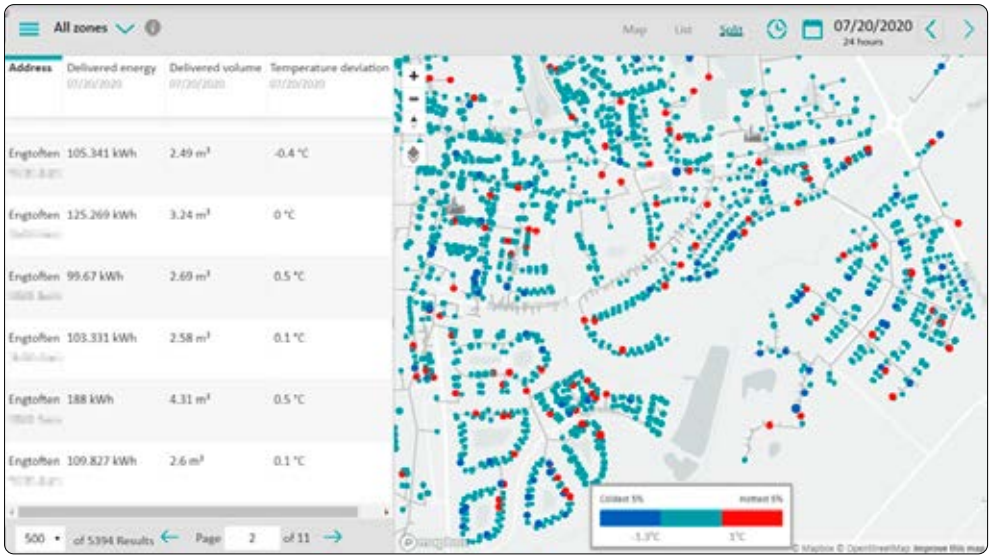


Map navigation includes zooming in and out and panning around the map to quickly go to the area of interest. It is possible to click a pipe section or consumer on the map to see more details and open a side panel on the right side of the screen for even more information including the development of data over time for a specific consumer.

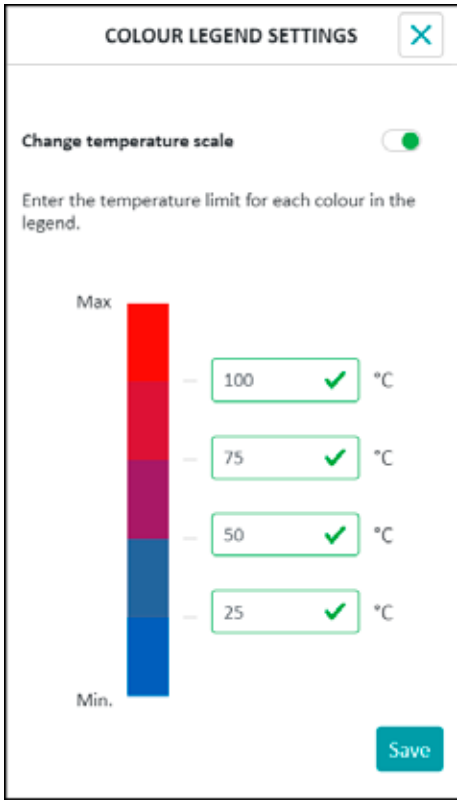
Different map types (standard, satellite or terrain) are available depending on your current needs. For example, you may want to select one map type if you need a clear and simple overview of the entire distribution network, and another if you want to examine a specific area more closely to determine, for example, the location of service pipes in relation to specific buildings:

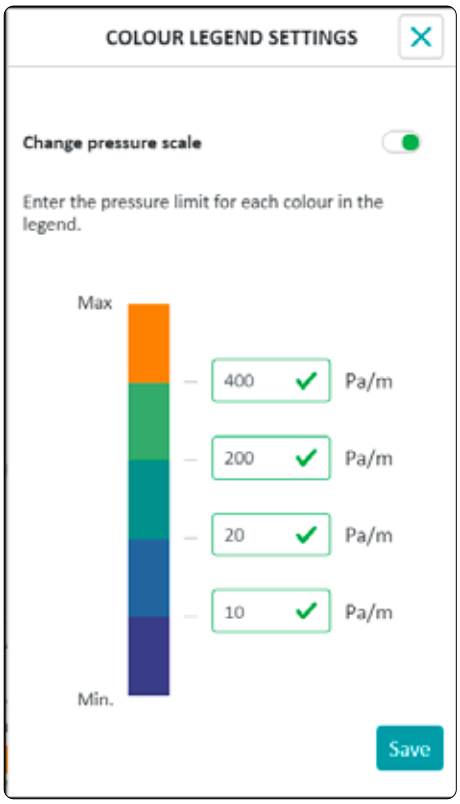


In addition to the map view, Heat Intelligence also enables you to see your data in a list.
The map view and list view can be displayed at the same time if desired:



Colour coding of temperatures and pressure gradients is easily configurable and can be adapted to fit your distribution network and your needs in different situations:



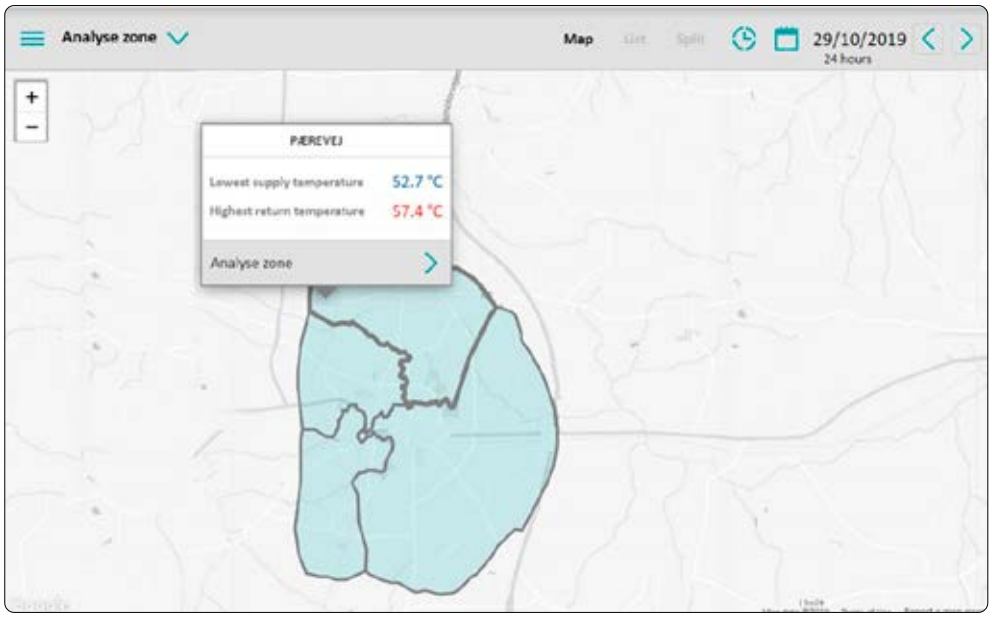


Finding the data you need

Heat Intelligence has different options for finding the data you need in different situations. You can narrow down your amount of data based on geographical area (zones), time and value range.

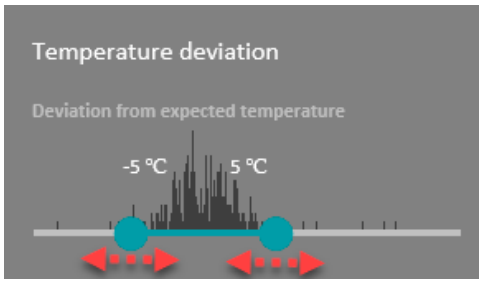
Zone-based analysis

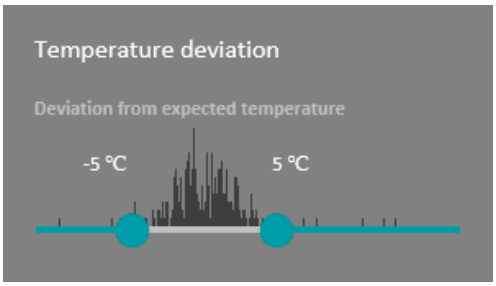
With zone-based analysis, you focus on a single zone in your network and omit the data from all other zones. Selected key performance indicators are available to give you a quick overview of the zone.



Value range

With the value filtering option, you can easily display data within a specific range or display only the highest and lowest values (outliers) and omit those in between:

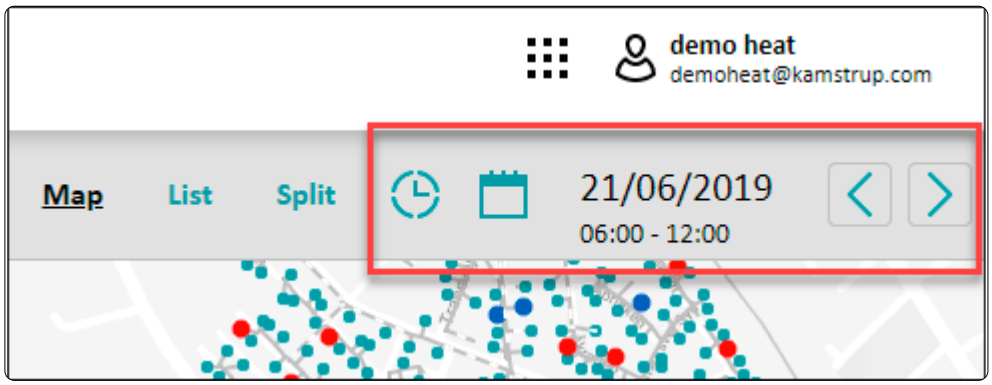


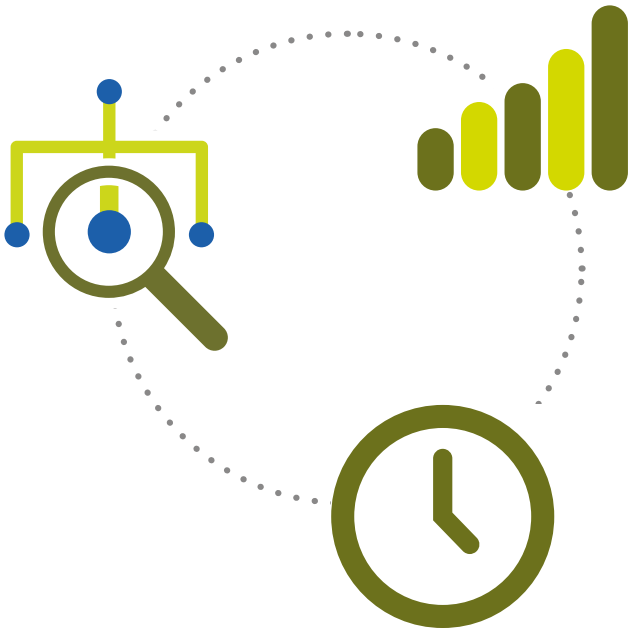


The ▬ line marks the selected values.

Date and time

You can choose to see the newest and most up-to-date data or you can go back in time and see the data for a specific date, even down to a six-hour interval. You can also look for sudden changes and problems in the network by quickly browsing through the data of more consecutive days.



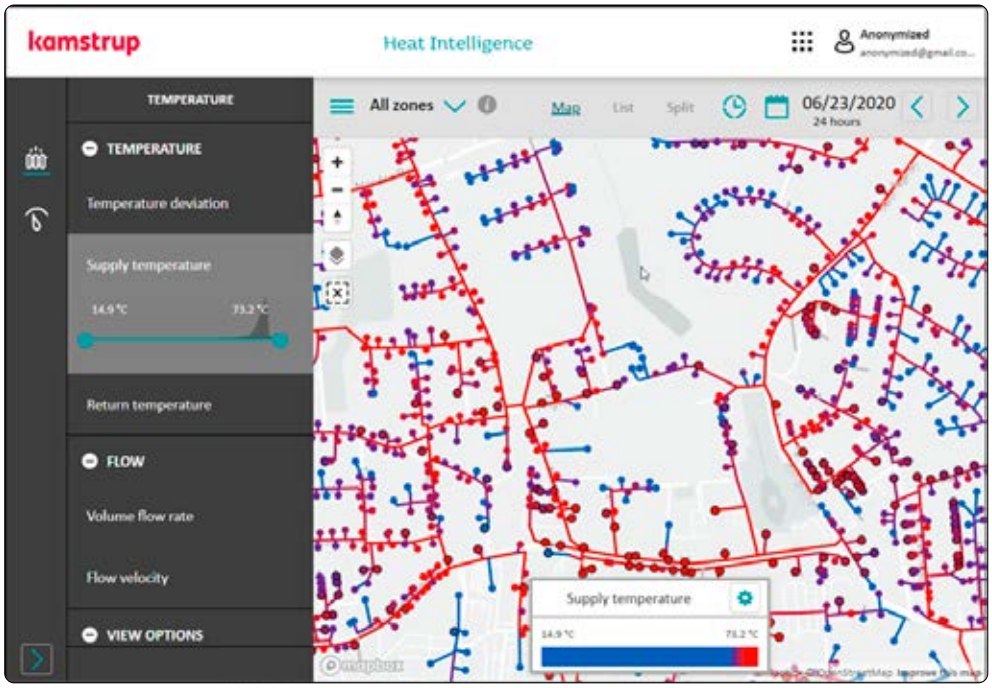


Analysis based on temperature data

Three types of temperature data are available for analysis: supply temperature, return temperature and deviations from the expected supply temperature. When you select the desired data type, the map of your distribution area reflects the temperature at any point in your network. Colours are used to indicate different temperature intervals and provide a clear and easily accessible overview of the temperature data.

Supply temperature

The display of supply temperatures throughout your network enables you to see how heat moves through your network infrastructure. This enables you to document the quality of your delivery to the consumers. It also enables you to monitor the effect of temperature optimisation efforts that you make.



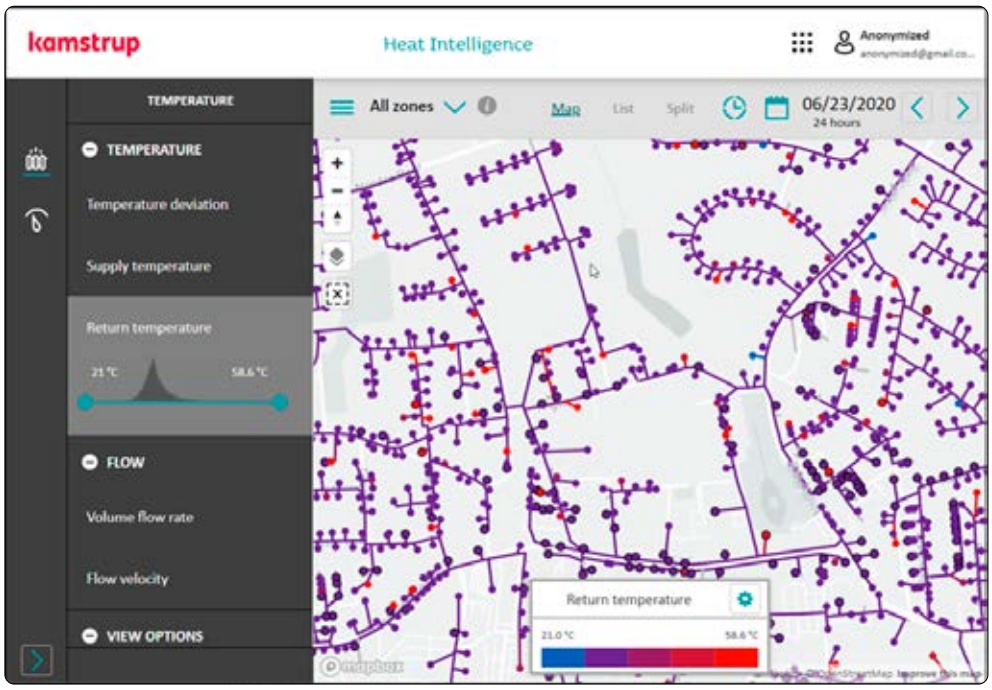
A filtering option allows you to identify consumers with a critically low supply temperature. For each consumer, further details showing the development of the supply temperature over a 30-day period is available.

Return temperature

Knowing the return temperature throughout your distribution network helps you identify your overall heat consumption and defective heat installations. It also allows you to keep an eye on consumers with a high return temperature and provide them with targeted advice and guidance.

...identify your overall heat consumption and defective heat installations

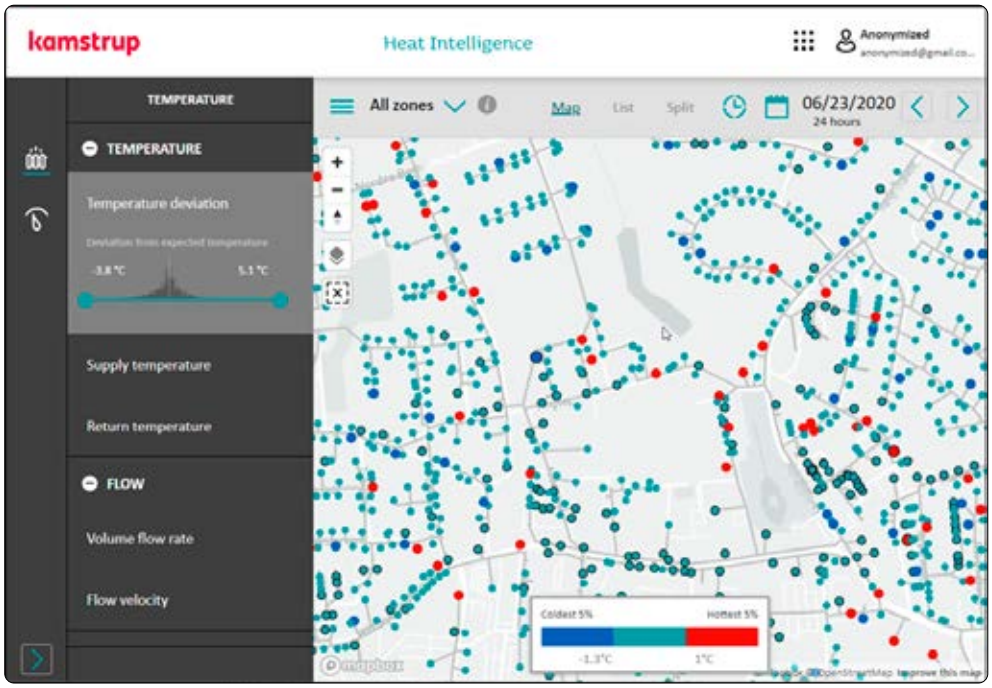
...keep an eye on consumers with a high return temperature and provide them with targeted advice and guidance



Filtering options are available to identify the consumers who put the most strain on your network. View their temperature details over time to discover if problems with the heat installation have occurred.

Temperature deviation

Heat Intelligence calculates the expected supply temperature throughout your network and shows positive and negative deviations from the expected temperature.



Continuous monitoring of temperature deviations enables you to spot negative or positive trends and react faster. For example, the continuous monitoring may suddenly show a combination of too high and too low temperatures in an area indicating a large leakage.

Or maybe you have many bypasses in your network without really knowing if they are necessary. If so, the continuous monitoring of temperature deviations enables you to see the effect of closing them.

A filtering option lets you display the deviations that you find significant. If the temperature is too low in a pipe section, the pipe insulation or the pipe itself may be damaged. If the temperature is too high, there may be a leakage or a bypass that you are not aware of.

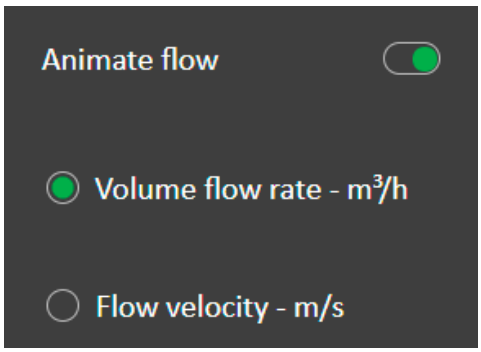
...spot negative or positive trends and react faster. For example, the continuous monitoring may suddenly show a combination of too high and too low temperatures in an area indicating a large leakage.

Or maybe you have many bypasses in your network without really knowing if they are necessary. If so, the continuous monitoring of temperature deviations enables you to see the effect of closing them.

Analysis based on flow data

Two types of flow data are available for analysis: volume flow rate and flow velocity. When you select the desired data type, the map of your distribution area reflects the flow at any point in your network. Colours are used to indicate different flow intervals and provide a clear and easily accessible overview of the flow data.

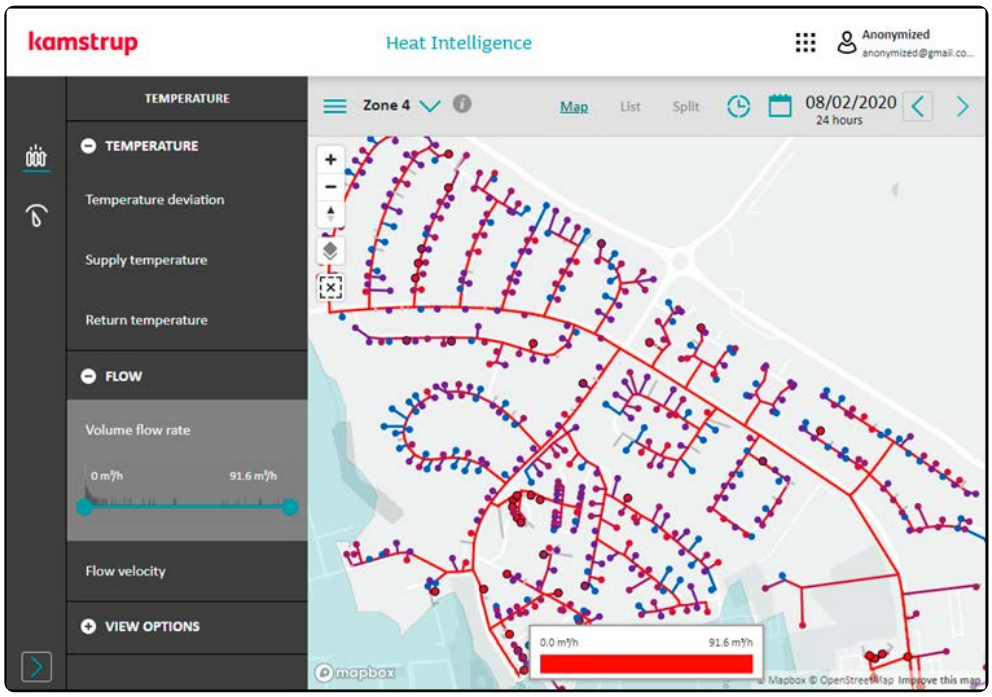
It is also possible to get an animated indication of the flow in the different pipe sections by activating a flow animation option:



Volume flow rate

Displaying the volume flow rate on the map enables you to see the amount of water flowing through the different pipes throughout your network per unit time. Knowing the volume flow rate helps you evaluate the capacity in your network.

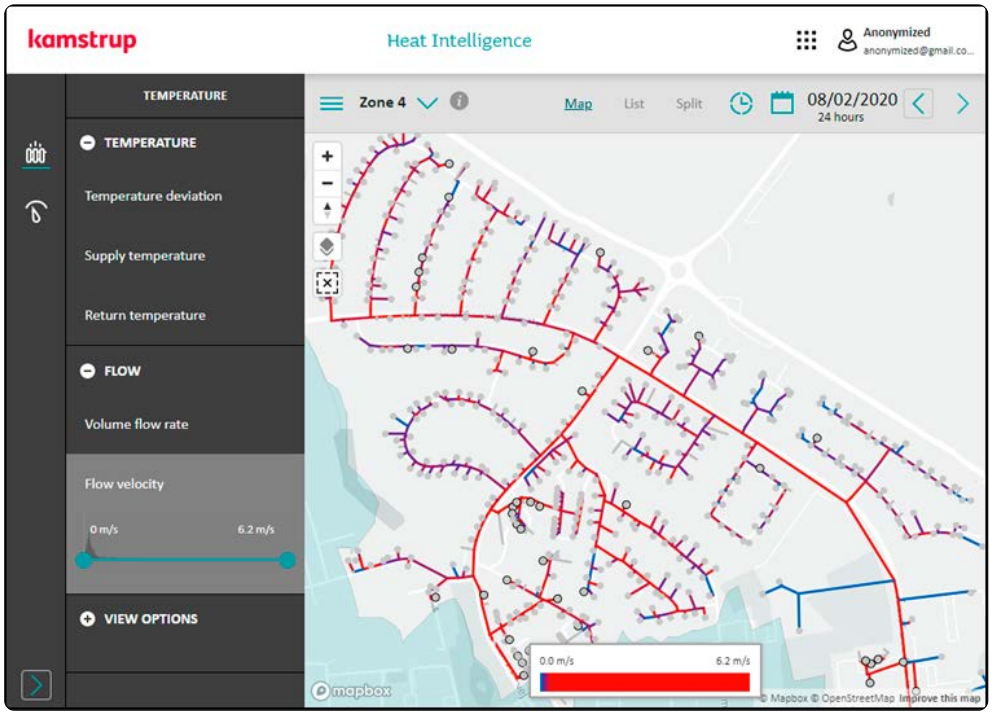
...evaluate the capacity in your network



Flow velocity

When you display the flow velocity on the map, you are able to see the speed at which the water is moving through the different pipe sections in your network. Knowing the flow velocity helps you estimate the pipe lifetime based on the load rather than just the age.

...estimate the pipe lifetime based on the load rather than just the age.



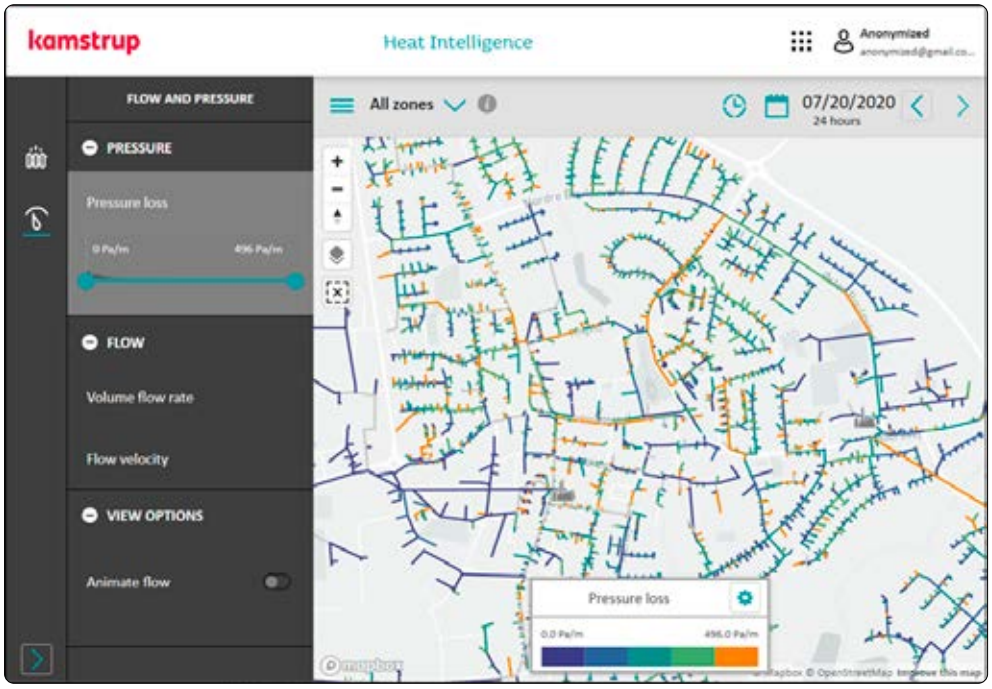
Bottlenecks and hydraulic balance

By analysing how the water flows through the pipe network, it is possible to detect pipes that constitute potential bottlenecks while other pipes may have very little, or even no flow at all.

Visualisation of the hydraulic balance in the pipe network enables you to improve the pipe network over time when planning maintenance and renovations, thus providing the best conditions for an efficient heat supply to the consumers.

Analysis based on pressure data

Pressure gradients per pipe section are available for analysis. The map of your distribution area reflects the pressure loss per meter at any point in your network. Colours are used to indicate different pressure loss intervals and provide a clear and easily accessible overview of the pressure in your network.

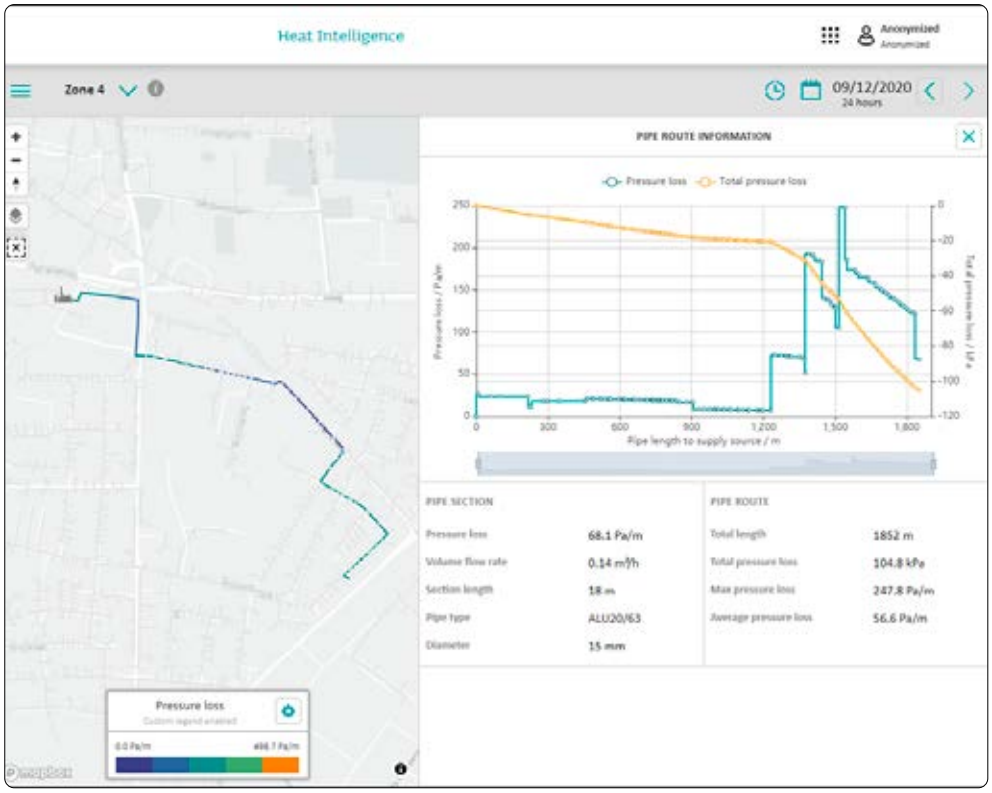


As with flow data, pressure gradients make it possible to understand the dynamic load and capacity of the distribution network and helps you identify bottlenecks and get more value from investments when planning maintenance and extensions of your distribution network.

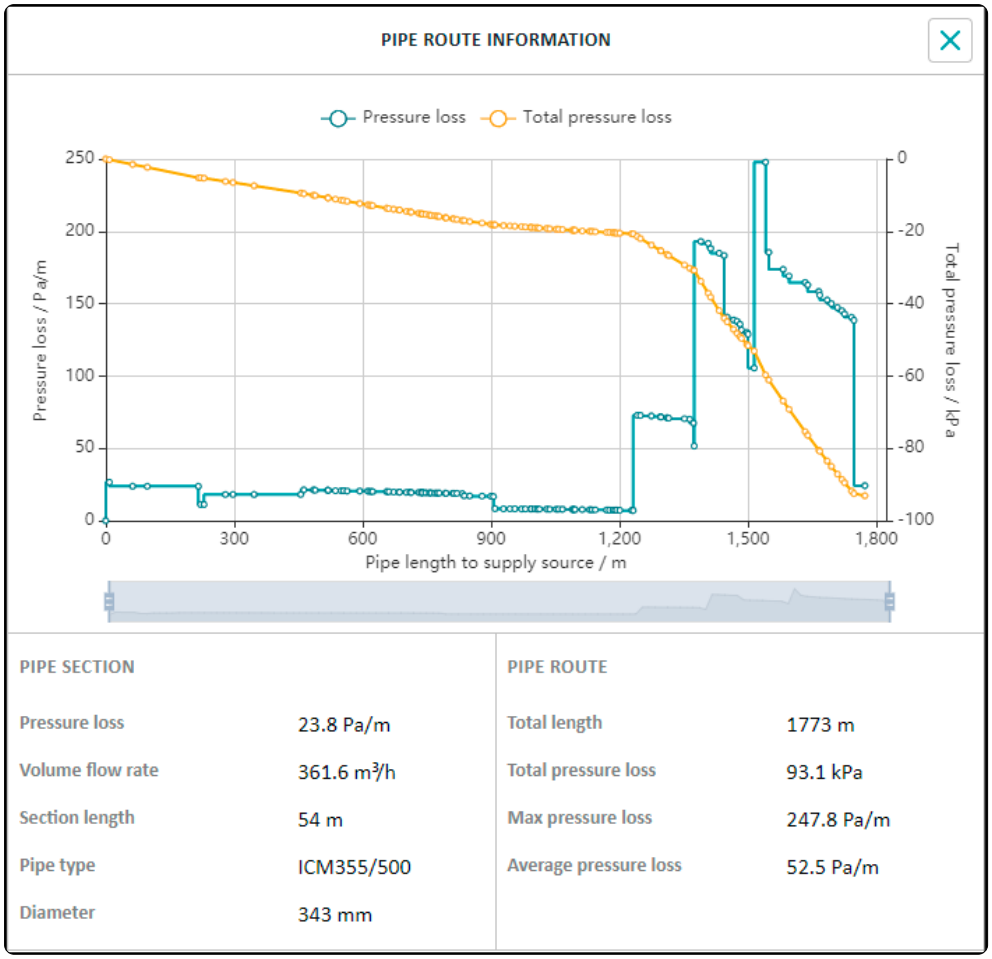
...understand the dynamic load and capacity of the distribution network.

...identify bottlenecks and get more value from investments when planning maintenance and extensions of your distribution network.

Furthermore, total pressure loss for entire pipe routes, i.e. all pipes from supply source to a consumer or another point of interest on the map, is also available:

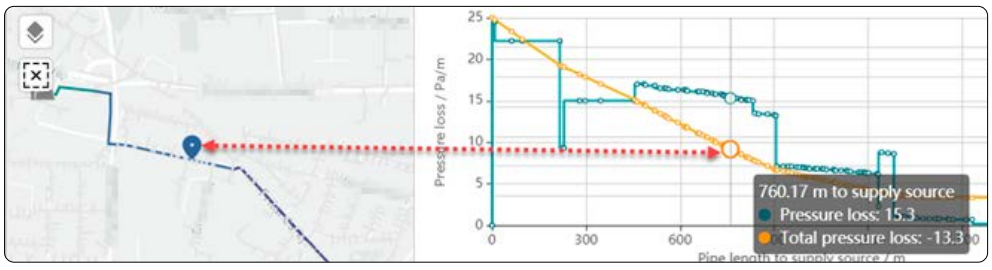


Pressure loss grahps show the pressure loss per metre for each individual pipe section in your pipe route (blue graph) and the total (accumulated) pressure loss for the entire pipe route (yellow graph):



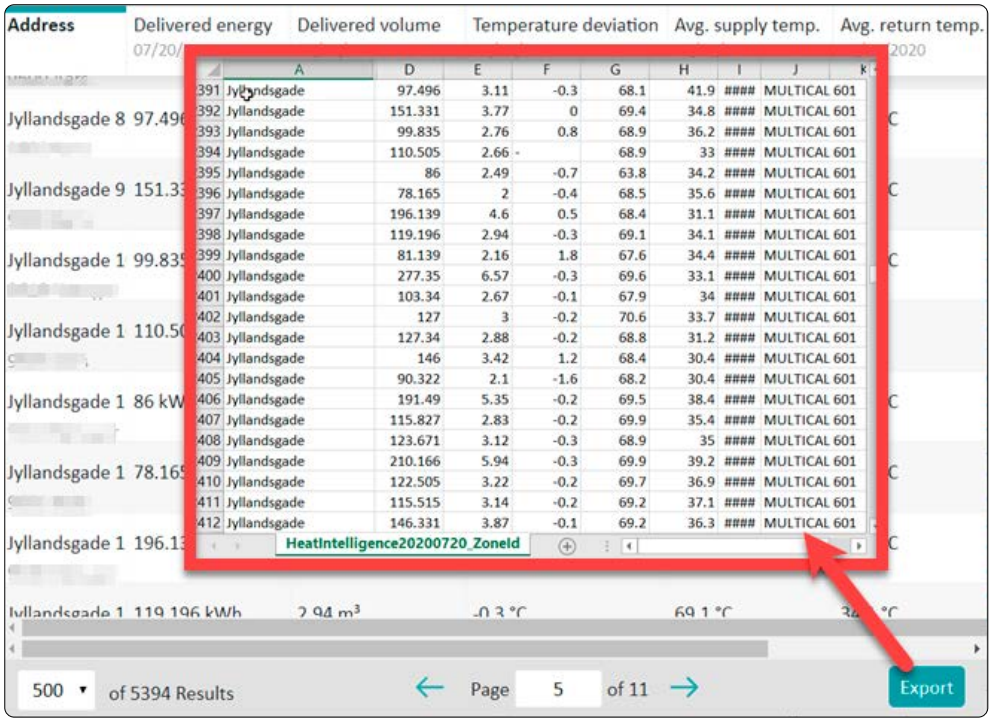
When you hold the mouse over the graph, a tooltip appears with the current pipe length to the supply source and the accumulated pressure loss up to this point in the pipe route.

An indicator on the map lets you continuously keep track of your current location when you move the mouse pointer over the graph:



Export of data

Data in Heat Intelligence can be exported in CSV format and opened, for example, in Microsoft Excel:



Data security

The Heat Intelligence application does not make use of personally identifiable data in any scenarios, which means that you do not have to worry about issues relating to General Data Protection Regulation (GDPR).

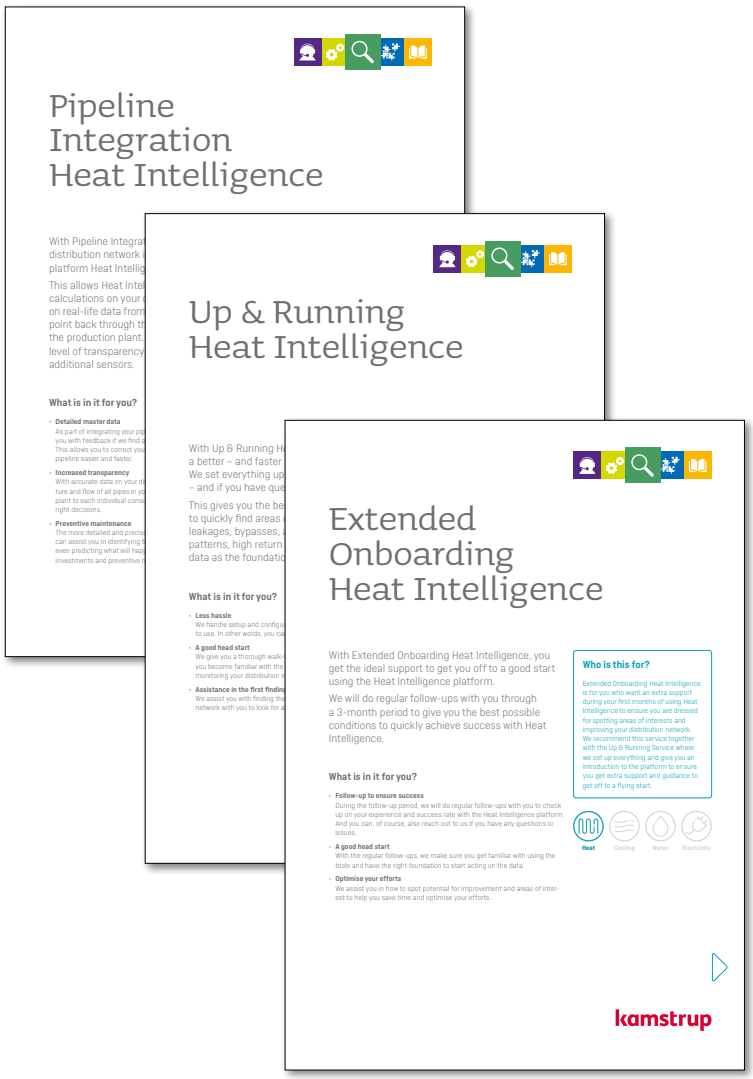
However, in order to ensure traceability and transparency in our solutions, it is possible to see via My Kamstrup which user logged in to the system and the time the login took place.

Service packages

Three service packages are available to make sure that you get off to a good start with Heat Intelligence. The two on-boarding services: “Pipeline Integration” and “Up & Running” are mandatory services.

In addition, it is possible to select the “Extended on-boarding” service. The aim of this service is to enable you to create value from Heat Intelligence more quickly.

During a 3-month period, Kamstrup proactively contacts you to ensure that problems are solved, that you receive the right training and generally to make sure that you fully benefit from Heat Intelligence.



Solution description – Heat Intelligence

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Kamstrup A/S
Industrivej 28, Stilling
DK-8660 Skanderborg
T: +45 89 93 10 00
F: +45 89 93 10 01
info@kamstrup.com
kamstrup.com