



SPECIAL PRINT



Controlling the Hydraulic Worst Case from the Cloud

Example: local heat supply network
operated by an energy supplier association

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Controlling the point of lowest pressure

In addition to providing the right temperature, one other factor is important in local and district heating networks: the differential pressure must be sufficient to supply all customer installations. The better the supplied differential pressure matches the demand, the less energy is required to operate the network pumps. The differential pressure can be controlled either directly at the heat generator's network pump or at the stations installed in index runs where the pressure drop is highest (hydraulic worst case). An index run is the section in a pipeline where the differential pressure is near the lower hydraulic limit. Controlling this hydraulic worst case can be challenging since there may be several points of lowest pressure in a network, which may be located far away from where the pump is controlled. This is the case in many networks and causes considerable extra installation work.

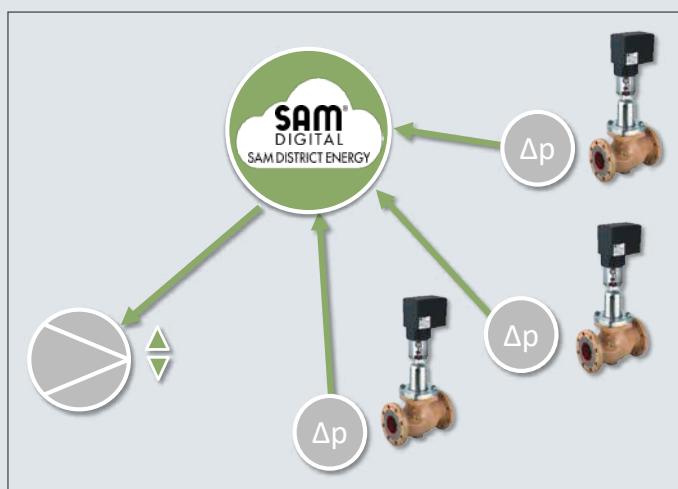


Fig. 1: Schematic drawing of how differential pressure signals are sent and received using SAM DISTRICT ENERGY

Practical implementation

Lathen, a community in northern Germany, expanded its existing local heat supply network, which is operated by the Energiegenossenschaft Emstal energy supplier association, to include control of the hydraulic worst case. This involved installation of the web-based SAM DISTRICT ENERGY asset management tool and SAM MOBILE gateways for mobile phone networks. The differential pressure at every station is measured by a sensor, which is connected directly to the SAM MOBILE gateway. The worst points in the network are not only those stations farthest away from the pump: depending on the hydraulic changes caused in the network by feeding and withdrawing, the worst points can also shift within the network. Thanks to the SAM MOBILE gateways used together with the SAM DISTRICT ENERGY portal, implementation of the worst-case control function is easy, flexible and quick. The web portal makes it possible to simply add further functions and applications to the existing control features. Benefits of this solution include quick installation and implementation as well as a high level of IT security. In addition, measuring points can be distributed all across the entire network as desired. This means that no restrictions apply concerning their distance from the pump or their location within the network. There is no need for complicated, expensive custom IT installations since the existing cloud-computing infrastructure can be used while observing German IT security standards.

Benefits for plant operators

Thanks to the lower pump output, energy consumption can be reduced considerably without sacrificing any convenience for the consumers. Substantial savings are possible by managing the pump's power consumption. Further positive effects are produced by a lower risk of flow-induced

noise and less stress on the components installed. Another benefit of the system is particularly important during the hot summer months: temperatures can also be monitored at transfer stations or route sections. As a result, remote monitoring, logging, analysis and parameter setting are available for the differential pressure, temperatures, heat meters and district heating controllers. Additionally, system adaptations can be implemented easily, for example when the district heating network is expanded. On top, the recording of controller data makes it possible to predict run

times and temperature gradients (temperature drops particularly at low load), which means that the temperature actually required for the network curve can be determined.

Outlook

In addition to the interconnection of the local heat supply network and the implementation of hydraulic worst case control, a follow-up project has already been started in cooperation with a local energy services provider (Energieagentur Lippe).



SAMSON AT A GLANCE

STAFF

- Worldwide 4,500
- Europe 3,700
- Asia 600
- Americas 200
- Frankfurt am Main, Germany 2,000

MARKETS

- Chemicals and petrochemicals
- Power and energy
- District heating and cooling, building automation
- General industry
- Industrial gases
- Food and beverages
- Metallurgy and mining
- Oil and gas
- Pharmaceuticals and biotechnology
- Marine equipment
- Water and wastewater
- Pulp and paper

PRODUCTS

- Valves
- Self-operated regulators
- Actuators
- Valve accessories
- Signal converters
- Controllers and automation systems
- Sensors and thermostats
- Digital solutions

SALES SITES

- More than 50 subsidiaries in over 40 countries
- More than 200 representatives

PRODUCTION SITES

- SAMSON Germany, Frankfurt, established 1916
Total plot and production area: 150,000 m²
- SAMSON France, Lyon, established 1962
Total plot and production area: 23,400 m²
- SAMSON Turkey, Istanbul established 1984
Total plot and production area: 11,053 m²
- SAMSON USA, Baytown, TX, established 1992
Total plot and production area: 9,200 m²
- SAMSON China, Beijing, established 1998
Total plot and production area: 10,138 m²
- SAMSON India, Pune district, established 1999
Total plot and production area: 18,000 m²
- SAMSON Russia, Rostov-on-Don, established 2015
Total plot and production area: 5,000 m²
- SAMSON AIR TORQUE, Bergamo, Italy
Total plot and production area: 27,684 m²
- SAMSON CERA SYSTEM, Hermsdorf, Germany
Total plot and production area: 14,700 m²
- SAMSON KT-ELEKTRONIK, Berlin, Germany
Total plot and production area: 1,060 m²
- SAMSON LEUSCH, Neuss, Germany
Total plot and production area: 18,400 m²
- SAMSON PFEIFFER, Kempen, Germany
Total plot and production area: 35,400 m²
- SAMSON RINGO, Zaragoza, Spain
Total plot and production area: 18,270 m²
- SAMSON SED, Bad Rappenau, Germany
Total plot and production area: 10,370 m²
- SAMSON STARLINE, Bergamo, Italy
Total plot and production area: 26,409 m²
- SAMSON VDH PRODUCTS, the Netherlands
- SAMSON VETEC, Speyer, Germany
Total plot and production area: 27,090 m²



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