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ABQM Case story

Renovation of a one-pipe heating system with **proven energy savings** of 18%

A six-building co-operative in Szczecin, Poland.

2.6 years
payback time
through modernization. Five times cheaper than installing a two-pipe system.

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Energy efficient control of one-pipe heating systems

A building co-operative in Szczecin, Poland, has reduced the energy consumption in their one-pipe heating system by 18 percent with a solution five times cheaper than a conversion to a two-pipe system.

Overview of the Installation:

97 risers were equipped with the AB-QT solution consisting of two elements:

- **AB-QM flow limiter valves installed at the bottom of every riser. AB-QM is a pressure independent balancing and control valve, which limits the maximum flow and adjusts the flow according to desired load.**
- **QT self-acting thermostatic actuators, which controls the return temperature.**

One-pipe heating systems can be a major challenge when it comes to indoor comfort and energy savings. An unbalanced installation will result in uneven heat distribution and unnecessary heat circulation. Residents and building owners experience this when the temperature drops and efforts to save energy by turning down thermostats are ineffective. Some radiators in the circuit were overheating while others were freezing cold. In other words, it is often close to impossible to control the heating efficiently in one-pipe systems.

Solutions for energy savings were needed in Szczecin

A six-building co-operative in Szczecin experienced the typical problems of a one-pipe system. Initiatives to limit the heat loss had already been introduced from 1996-2002 with insulation of the walls, putting in new windows and the installation of Danfoss thermostatic radiator valves on 697 radiators in each building. It helped to a certain degree. But energy consumption remained relatively high and the residents continued to find it difficult to achieve the right temperature in their apartments. The building co-operative realised that they needed to do something about the one-pipe system. But, converting to a two-pipe system requires major reconstruction and sizable investment.

Substantial savings in energy and costs achieved

The building co-operative chose to invest $296,000 in a modernization of the one-pipe system. A decision that saved them five times the costs of a reconstruction to a

two-pipe system. And because of the 18 percent saving in energy consumption, the investment is paid back in only 31 months.

Danfoss provided a solution to control the flow of the buildings' risers based on the return temperature of the flow. All 97 risers in each building were equipped with the Danfoss AB-QT solution, turning the one-pipe system into a variable flow system by reducing the flow rate in the riser whenever partial load conditions occur. This ensures an even heat distribution. Furthermore, it controls the flow in the risers based on the return temperature of the flow, which reduces the heat loss.

After installation the solution has been closely monitored, and the results show that the energy consumption has been reduced by 18 per cent, and CO2 emissions have been cut by 113 tons per building.

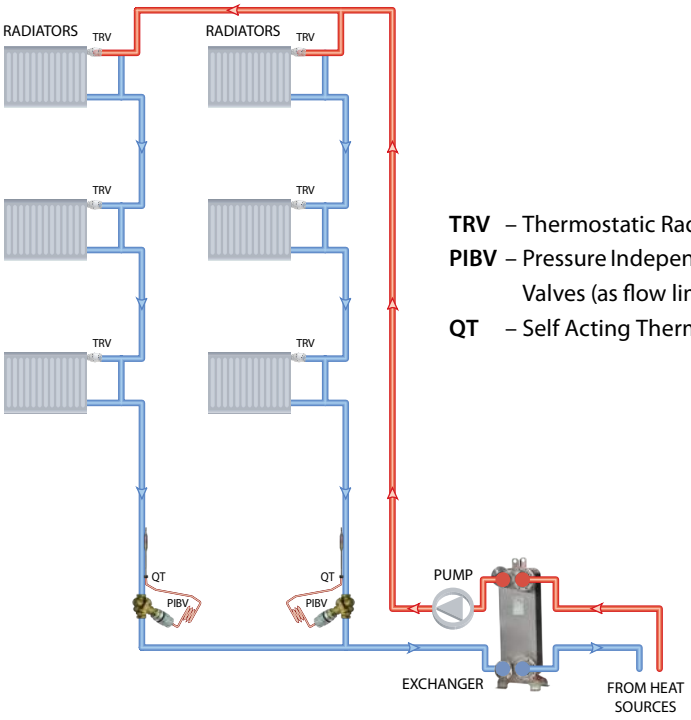
Robust installation requiring minimum maintenance

The end result is not only a cost-efficient heating solution yielding significant savings. The technical manager of the building co-operative in Szczecin is also impressed by the stability of the new solution, which has run uninterruptedly since installation.

Once installed, the system does not require any additional investment apart from ordinary, occasional maintenance. In addition the number of complaints from residents has been reduced, and the 180 dwellers have expressed their satisfaction with the pleasant indoor climate and stable room temperatures no matter where the apartment is located in the buildings.

"Our primary goal of saving money on the energy bill has been achieved. And we expect no further investment apart from occasional maintenance."

Krzysztof Borysiewicz
Technical Manager of the Szczecin building co-operative

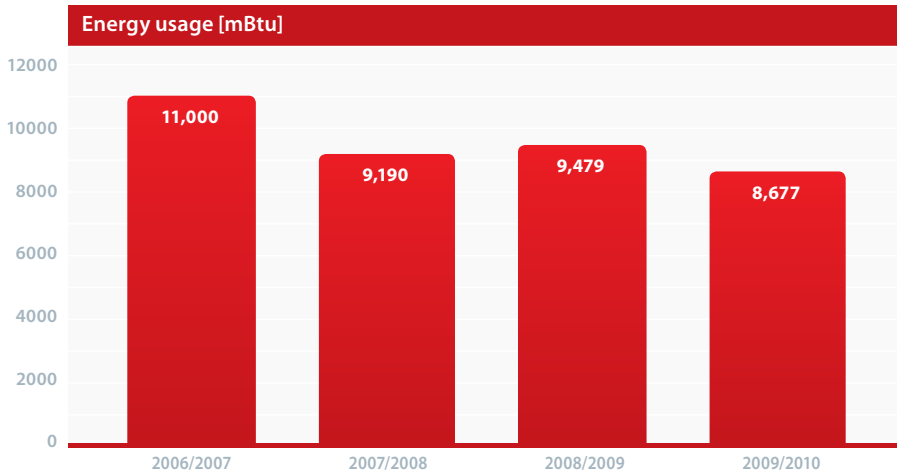


TRV – Thermostatic Radiator Valves
PIBV – Pressure Independent Balancing Valves (as flow limiter)
QT – Self Acting Thermostat

Savings

Investment type	AB-QM + QT
Investment costs	$43,873 USD
Av. energy saving from three heating seasons	1220 mBtu
Energy price (DH)	$13.92 USD/mBtu*
Pay back time	**2.6 years**

* as AB-QM and QT were installed in December 2009.



Energy savings:

Measurements have shown that the Danfoss AB-QT solution has reduced the energy consumption in the building co-operative by 18%. At the same time CO_2 emissions have been cut by 113 tons per building.

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3 good reasons to choose Danfoss

Danfoss is more than a wide range supplier of premium solutions. Our customer insight and technical expertise also make us a strong partner for your business.

1 Broad application know-how and customer understanding

2 Supplier of solutions with a wide product range

3 A strong and dedicated business partner

Find more Danfoss references and case stories at www.abqmvalves.com

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