

Room control with self-powered intelligent thermostatic radiator valve – the Micropelt thermogenerator makes it possible

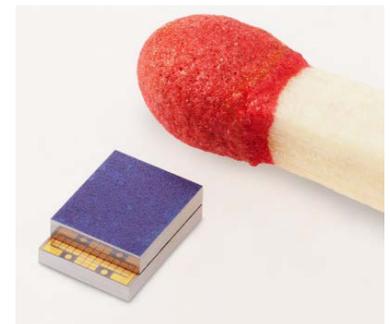
In residential and commercial buildings, numerous heating radiators can now be operated by a room controller, in combination with a new self-powered and maintenance-free intelligent thermostatic radiator valve (iTRV). The Micropelt thermogenerator makes this battery-free wireless solution possible by supplying electricity to control the servomotor and operate the EnOcean transceiver module.

Peter Kauf, Head of Business Unit Systems, Micropelt GmbH

Scientific studies show that a single room controller can reduce heating costs by up to 30%. Until now, however, electric valve actuators were needed that were either connected via a cable or were powered by batteries. Both options have major drawbacks since installing a cable is always highly cost-intensive, and batteries must be changed regularly.

Smart collaboration

By using the efficient Micropelt thermogenerator, Micropelt engineers together with specialists in drive technology from Precision Motors Deutsche Minebea GmbH and EnOcean Alliance promoter Thermokon have succeeded in developing a completely self-powered intelligent thermostatic radiator valve. Thanks to clever mechanical design, the temperature difference between the water flow through the radiator and the air in the room can be used to harvest power. The tiny Micropelt thermogenerator converts the temperature difference into electrical energy and supplies a smartly controlled DC booster, which in turn powers the EnOcean module and the actuator electronics.



Energy even outside of the winter months

Economical microprocessors combined with energy-optimized control and communication algorithms from EnOcean ensure that average consumption is kept at a minimum. As a result, the valve actuator can regularly communicate with the room controller. Moreover, the intelligent thermostatic radiator valve has a rechargeable storage element to store surplus energy, meaning the valve actuator can also work during the transitional months of spring and fall despite the lower heating flow temperature. In the summer, the valve actuator automatically enters sleep mode but wakes up again as soon as the heating is turned back on.



Control when required

For the single room controller, the valve actuators (acting as receivers) are connected to a Thermokon MSG server, which receives the control parameters from EnOcean-based room sensors, window contacts or handles and uses these to periodically calculate the valve positions for the desired room temperature. The target temperatures are retrieved from the MSG server using time profiles as well as presence detection: the comfort temperature used when the rooms are occupied and the lower energy-saving temperature used when they are not or the windows are open. The MSG server sends the appropriate position commands to the valve actuators, which then accurately adjust the heat flow for each radiator.



Thanks to its independent functionality, the battery-free intelligent thermostatic radiator valve is essential for the single room controller, especially when it comes to renovation and modernization work. With its high-quality housing, the heating controller is perfect for even the most refined spaces and living environments.

About Micropelt

Micropelt GmbH, Freiburg Germany manufactures and markets the world's smallest and most effective thermoelectric components for micro energy harvesting. Micropelt thermogenerators scavenge free electric energy from waste heat, so they can power wireless sensor networks, smart sensors and actuators.

Micropelt also offers battery-free wireless actuator and sensor systems for building and factory automation. An example is the self-sufficient iTRV (intelligent thermostatic heating valve), which interoperates with a room controller using EnOcean's wireless standard. The -retro-fit self-sufficient iTRV addresses all installed European heating radiators and offers an energy saving up to 30% !

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