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Maintenance-free degassing of solar thermal plants

Keywords

Degassification, Solar collector, Solar thermal energy, Maintenance free

Summary

The degassing solar collector provides an easy way of continuous degassing of a solar thermal plant during normal operation. Neither electrical power nor feedback control is required. The degassing collector contributes to the solar power of the plant like any other solar collector. The additional costs are low since the degassing collector is based on the design of a standard collector.

Background

Free gases in the circuit of solar thermal plants cause many problems, from reduced efficiency up to operational breakdown and damage due to water hammer. Until now vacuum degassing is the only practical way for the degassing of solar plants. Because of the considerable costs, vacuum degassing is done by using mobile devices in the commissioning procedure.

Patent Status

- Patent pending

Invention

The degassing collector consists basically of a solar collector. Special modifications and/or add-ons provide for the degassing functionality. The basic principle is to reduce the flow-rate in the degassing collector so that its outlet temperature is much higher compared to other collectors of the same plant. The gasses desorb due to decreasing solubility with rising temperature or, if the fluid reaches boiling conditions, due to steam which acts as stripping gas. The gas-liquid mixture is then cooled down below boiling temperature and led into a standard air separator which releases the gas bubbles into the environment. After that, the degassed liquid is fed to the main circuit (Fig. 1). Integrated into solar plants, one single degassing collector has the capacity to provide for the continuous, maintenance-free degassing of a multiplicity of solar collectors.

Features & Benefits

- Continuous degassing, removes gases which enter the system by diffusion
- Small initial investment for the maintenance-free system
- No control and no electric energy required
- Increases the lifetime of heat carrier fluids and system components
- Robust technology
- Keeps efficiency at the maximum

Field of Application

- Solar plants (Fig. 2, Fig. 3)
- District heating networks
- Refrigeration plants

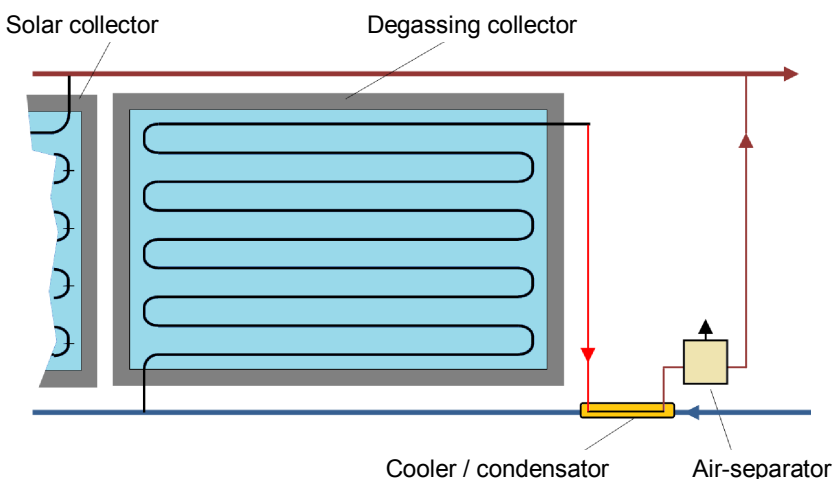


Fig. 1: Principal setup of the maintenance-free degassing solar collector unit



Fig. 2: Solar plant (source: Solarline)



Fig. 3: Solar plant (source: Austriasolar)

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