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Dry-running protection with acoustic surface waves

Bases of the new technology of an dry-running protection for pumps (also: Pump protection) are new realizations for the propagation of surface waves. The characteristics of Rayleighwaves are used in new sensors for applications in liquids and multi-phase mixtures. The new ultrasonic sensors are registered as Utility Model Applications and the procedure are announced with the German patent office to the patent. The new technology differs from the well-known state of the art, like time OF flight or pulses technology, by its independence from the transmission characteristics of the liquids. The well-known procedures for reason lying idea, the evaluation of flutter echoes in a gate far outside of tube sheet reflections and reflections in the sensor (diaphragm and own decaying), can be used both for measurement by the wall (no contact of the sensor with the medium), and for measurement with screwing in sensors in the tubing or container wall. However bad transmission characteristics of the liquid have an unfavorable effect. Against it if Rayleighwaves to the attendance supervision or detection are used by liquid phases, are the transmission characteristics of the liquid without influence on the function of the sensors. Thus screwing in sensors for the Low cost range, and fastidious measurements can be realized by the wall at containers and aggregates. With screwing in sensors thereby an optimal signal transmission is guaranteed. The height of the



transmission tension can be minimized therefore. Also with unfavorable reflectors (curved tube sheets, pump impellers etc.), which so not sufficient echoes causes, can therefore the presence of a liquid be determined. For all processes and applications, where the sensor contact with the medium does not disturb, thereby a simple dry-running protection is possible. The measurements by the wall adhering the lack of problematic start-up (couple conditions between sensor and tube sheet should be defined and as reproducible as possible) becomes groundless thereby. Particularly for solid-loaded liquids, salt solutions or suspensions generally, this technology is favourably applicable.