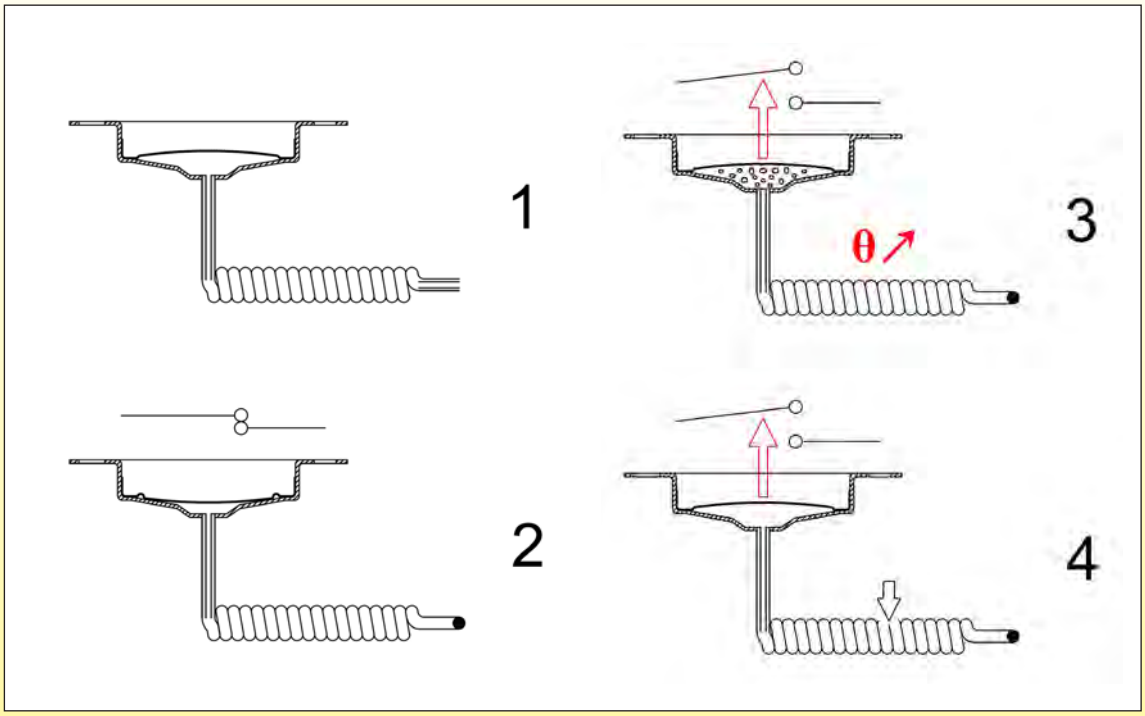
Boiling style failsafe systems



In boiling type fail safe systems, the bellows of the diastat consists of two dishes, one of which is bumped.
This bumping is of convex shape, as a bimetallic disc, and snaps from convex to concave when subjected to a force. The diastat, before filling (1) is constructed so that the cup is in the unstressed position is outwardly bulged.
The diastat is then filled with thermostatic liquid under vacuum, then sealed with the cup pushed inwards (2). In this position, the electrical contacts are closed.
In case of temperature rise, the liquid boils at the temperature determined by its composition. The substantial increase in volume caused by the boiling causes the change of shape of the cup, which snaps outwards and opens the contact (3). Upon cooling of the liquid, the force produced by the diastat and required for bumping inwards the cup is insufficient, and it is necessary to press it with a reset button to restore it to its inward form.
In case of punctures or leaks in the diastat, the liquid inside is set to the atmospheric pressure, and the cup snaps outwardly.
This system is particularly simple, reliable, and requires no complicated mechanism. It is not sensitive to the ambient temperature on the capillary or on the head, does not trigger unexpectedly when ambient temperatures are too low.
It has, however, like the previous one, two flaws:
• Triggering temperature depends of boiling liquid used (Generally mixtures of water, glycol and alcohol), and therefore they are practically limited to values between 60 and 170 ° C.
• They are sensitive to atmospheric pressure and set point varies slightly with altitude.