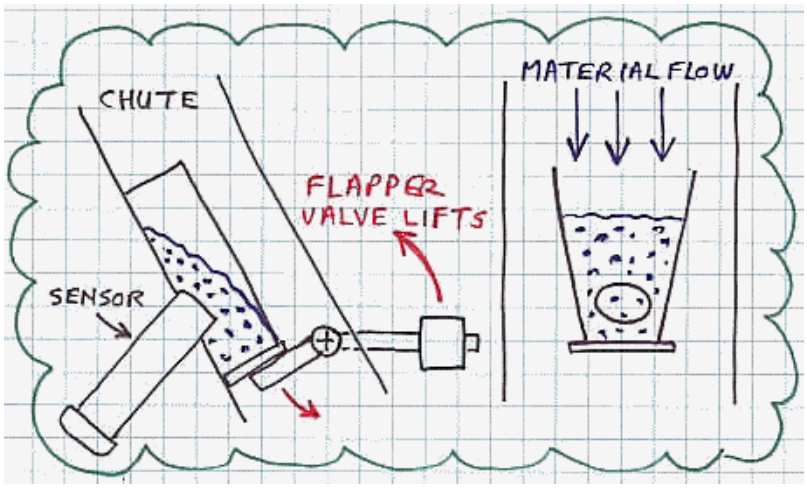
SCALE-TRON

Perfecting the Art of Concrete Production

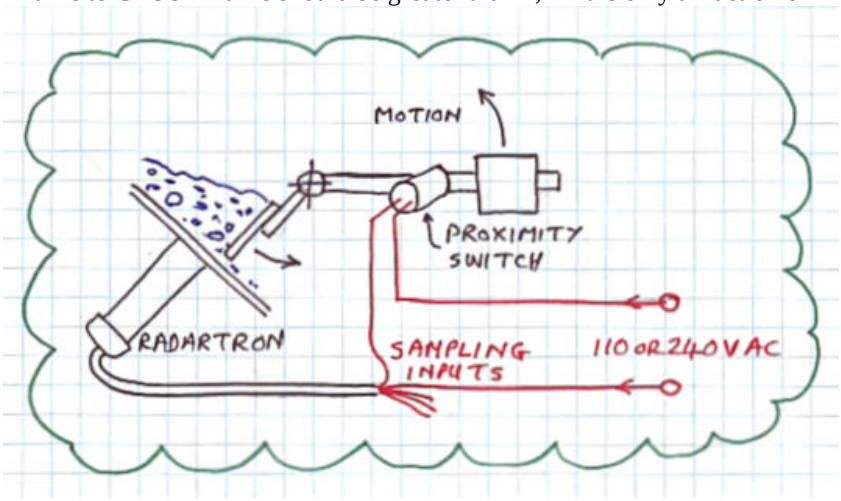
APPLICATION NOTE - RADARTRON IN CHUTES

In order for a moisture sensor such as the RadarTron to work properly, it must have a bed of material at least 4" (10cm) thick in front of the faceplate. Further, the material must be of a known or constant density. In chutes, the material tends to move quickly and is suspended in air, preventing the two conditions above from being fulfilled. The material must be held or restricted for it to build up. This is difficult to do without creating a stagnant bed of material which does not move, however.



We have successfully overcome these obstacles in a recent installation by using a few tricks. The first is to channel the flow into the centre of the chute with a funnel-like channel. The second is to build a "flapper valve" which alternately holds the material and releases it, allowing fresh samples to be measured. The flapper valve is hinged, with a counterweight arranged to keep it closed until the chute is completely filled with material, when it will open and let the material out. This also prevents the blockages and build-up which could be caused by lumpy material.

The third trick is to prevent the sensor from taking readings when there is no material in the channel. This is done by mounting a proximity switch so that it closes when the flapper valve is closed. This can be accomplished by positioning it under the counterweight arm in its rest position. Make sure that it is a few inches out from the shaft so that the arm moves well away from the switch when the valve is open. The switch is connected so as to cut off the power to the SAMPLING input when the valve is open. For best results, the proportion of OPEN time to CLOSED time should be greater than 1; if it is only a fraction of the total time, the averaging will take several minutes. We can modify the sensor to average faster if necessary.



If the flapper valve does not oscillate reliably (which usually occurs when the flow rate varies appreciably), it is better to power it with a pneumatic cylinder, solenoid valve and a time delay relay set in the oscillating mode. Make the oscillation time long enough for it to fill and stay filled for at least 10 seconds at a time.

The system described here is in regular use in controlling the burners in a drying plant for bentonite on one of the Greek Islands. Call, fax or Email if you would like the customer's name as a reference.

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