



MRT-1014 (7/22/15)
"Solder level and wave height control"

We have devised 2 separate improvements to control the solder and wave height.

First, it is important that the molten solder level in the pot is consistent, as varying heights cause variances in the differential head pressure to the pump and therefore the wave. The titanium probe originally used to sense the volume of solder in the tank worked by sensing the level through "continuity". As the solder rose and touched the titanium probe the wire feeder was shut off. Problem: if the probe is not cleaned daily flux residue would collect on the probe and insulate it causing a solder overfeed. We have perfected a new type of sensor that used back pressure or blockage of a slight stream of nitrogen in contact with the molten solder surface. This new sensor circuit has proven to be immune to flux contamination (in fact it is self cleaning), reliable and virtually maintenance free. This feature is on all new machines with the KSM solder make up option.

Second, with the molten solder level in the pot held consistent we addressed and perfected a method to control the actual wave height at the nozzle tip. This device consists of a simple titanium probe and a software routine (there isn't any flux contamination at the nozzle tip to be concerned about as the flux residue only floats on the solder surface within the pot). When setting up a process for the first time you will always set the appropriate solder dome or wave height you choose to use for that specific board. Once the wave height is determined, a "hot button" moves the nozzle directly under the titanium probe. You jog the "Z" axis up till continuity is made, then "teach" this Z height. This in effect becomes the XYZ co-ordinates for verification of the wave height from then on. At anytime during or between production runs you can set the process to check and adjust the wave to the original height. If continuity is made at the original XYZ co-ordinates then production continues. If continuity is not made the pump RPM is incrementally increased until continuity is made. This is all automatic and works well.

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