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Margin Meter Model A-4000

Preliminarily

GENERAL INFORMATION

The Margin Meter system monitors the casing size at the input of the dryer for quality purposes. The new system is an upgrade of the previous system, improving accuracy and precision because of the use of a new transducer and high precision electronic components.

The new Margin Meter A-4000 monitors not only the deviation of casing size, but also the actual size of the casing. The size reading is based on the lay-flat measurement, (millimeters) making the system easy to compare to other readings through all the process.

The monitor works as follows: the signal coming from the transducer is amplified and scaled to a proper reading. Then it is compared to internal thresholds based on pre-defined tolerances. If the signal goes out of tolerance the monitor will assert an output alarm. There are two alarms, one for HIGH and one for LOW tolerance.

The tolerances can be viewed through a two 3-digit displays on the front panel. The top one is the HIGH limit and the bottom one is the LOW limit. They can be set totally independent one each other through precision potentiometers on the back of the monitor. When the casing size is too high, a LED lamp located at the right side of the tolerance reading, will lit up indicating the size is out of tolerance because of high size. On the other hand, when the casing size is too low, the LED lamp located at the bottom right side will lit up. In both cases the monitor will assert relays alarms that are connected to a control circuit to take corrective actions on the process.

The 4-digit display at the center displays the actual casing size and the deviation from a pre-determined set point. These measurements can be selected through a switch located at the left-bottom side of the front panel. The deviation reading is useful when calibrating the system for a determined casing size, the same way as the previous system was set. Once the calibration is performed and the machine is in steady state, the switch can be turned to display the actual size of the casing.

The center potentiometer in the front panel is use to determine the set point. This potentiometer has a graduation to make the calibration easy. The calibration process would be a one-time task when the correct set point is required to find. Once the set point is found, the graduation will be set and then it can be used every time the same size is running on a particular machine.

The switch at the right-bottom side of the front panel is an alarm enable/disable switch. When the alarms are disable the top and bottom 3-digit display will flash, alerting the operator the process is not under control by the monitor. This mode of operation is intended to use when a calibration is require and the set point is not defined yet. Once the set point is properly defined, the alarms can be enabled by turned the switch, the tolerances readings will stop flashing and the monitor will control the process.

CALIBRATION PROCESS

Before setting the monitor to control the casing size, a working set point is needed to set in order to compare with the tolerances. This value would be the size of the casing at the input of the dryer, when having a casing size at the output with zero deviation from the standard size.

By setting a proper standard block on the rollers at the transducer measurement point, and then zeroing the center reading (Zero switch) by using the set point potentiometer, the calibration process would be complete. This would be done in the same way as the previous system. However a new set of standard blocks would be needed, because of the different characteristics of the system.

During the machine running, slightly corrections on the set point may be required. Although the monitor can get the size under control at the input of the dryer, it may come out with the wrong size at the output of the dryer because of a wrong set point. The set point changes as follows: it increases when moving the potentiometer clockwise and it decreases when moving the pot counter-clockwise.

The following is an example of what would happen if a correction on the set point is needed:

- 1) Margin Meter gets the casing size under control. There's no action on the alarms, both LEDs , HIGH and LOW are OFF. However the size at the output is TOO LOW. That means the set point on the Margin Meter is too low.
- 2) Move the set point potentiometer slowly clockwise. The LOW limit LED will start to flicker or eventually will be steady ON.
- 3) The control actuators will tend to increase the size until the size is under control again. When this occurs both LEDs at the front panel would be OFF.
- 4) Check again on the size at the output of the dryer. If it is still TOO LOW, repeat step 2.
- 5) If for some reason the set point was incremented too much at 2) move the potentiometer slowly counter-clockwise. The HIGH limit LED will start to flicker or eventually will be steady ON.
- 6) The control actuators will tend to decrease the size until the size is under control again. When this occurs both LEDs at the front panel would be OFF.
- 7) Check again on the size at the output of the dryer. Repeat steps 2) through 6) until sizes, output and input are under control.
- 8) Take a note on the graduation of the set point potentiometer. That reading would be the set point value found.

The value found at step 8, would be the value to be used next time that size need to be run in that machine. In this case the standard blocks it would be necessary to use anymore.

The alarm enable/disabling switch would be used only if the size is not under control at the input of the dryer, and the size at the output is also out of tolerance. This would happen when changing casing size without a proper block.

