

The functionality and effectiveness of 3rd party leak testers such as the Cosmo LS-1842 and LS-1841N can be quickly and easily upgraded by retrofitting Sciometric's sigPOD PSV process monitoring system on top of the existing installation. By piggybacking on the Cosmo's analog output signals, complete leak test waveforms can be acquired and analyzed to provide superior defect detection, while accelerating test optimization and validation.

Challenge

Companies that have standardized on conventional leak testers such as the Cosmo LS-1842 and LS-1841N often struggle with the limited data they provide. In general, only a maximum leak rate value is presented, with no additional analysis or monitoring of the leak test waveform available. As a result the tester may miss certain failure modes altogether, generating an increase in downstream failures or a drop in product quality. False failures resulting from test issues such as a faulty fill cycle may also go undetected. Furthermore, without the ability to capture and analyze the leak test data throughout the test cycle, test parameter optimization and validation is a time-consuming, iterative process that in the end may or may not yield the optimal settings. This can have a significant impact on both the manufacturing yields and the cycle time of the test.

Solution

Although these Cosmo testers display only the maximum leak rate value, the raw leak test waveform is actually provided as an analog output on the rear panel of the unit. By monitoring this output while triggering off the Cosmo's digital control signals, a Sciometric sigPOD PSV can be configured to automatically record the measured leak test waveform on a part by part basis. In this configuration, the actual leak measurements continue to be performed by the Cosmo tester, while the sigPOD piggybacks on the Cosmo's analog output, collecting, analyzing and storing the complete waveform data for each part. A schematic illustration of the electrical connections between the sigPOD and the Cosmo tester is shown in the figure below.



BENEFITS

- Upgrade to full waveform analysis from simple maximum leak rate measurement
- Detect, analyze and eliminate a wider range of defects
- Dramatically reduce commissioning and validation times
- Maximize first time yields, minimize cycle times
- Simple add-on to installed base of Cosmo leak testers
- Installs quickly and easily
- No changes to leak test fixture or set-up required



Cosmo Leak Test Upgrade

Implementing Process Signature Analysis on a Cosmo Leak Test Station

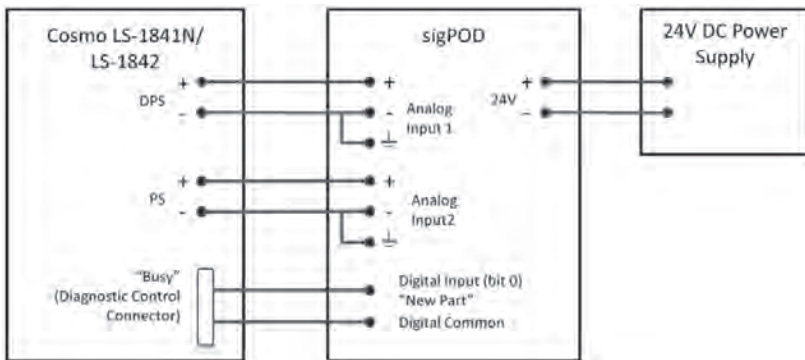


Figure 1: Schematic diagram of electrical connections between sigPOD and Cosmo leak tester.

Achievement

With the complete leak test waveform now available for analysis on the sigPOD monitor, it is possible to identify and diagnose failure modes that might otherwise go undetected, enabling the development of additional feature checks to minimize downstream failures. These can then be applied in real-time on the manufacturing floor, instantly improving downstream yields. The sigPOD system comes with a minimum of 40Gb of on-board storage, enough to record full waveforms and features for thousands of parts. This enables the rapid review of trends and distributions right on the test stand. The data can also be quickly and easily uploaded to Sciometric's QualityWorX analytical software, where the impact of test parameter changes can be simulated in minutes. This allows for the rapid optimization of pass/fail criteria, minimizing commissioning times and ensuring maximum yields. In addition, QualityWorX enables cross-correlation of parametric trends or yields across multiple leak test stands, or even across the entire end-to-end manufacturing process.



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