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# SOLUTIONS FOR COMPRESSORS



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## COMPRESSORS

The Loccioni Group has developed an innovative automatic testing system for compressors that could be integrated and work in parallel with already existing lines. The system detects the principal functional and mechanical characteristics of compressors along the production line.

The system is able to detect the major causes of defective behaviours of the compressors **performing the following tests:**

- > Pumping
- > Leakage
- > Current absorption
- > Insulation
- > Vibration and Noise level

**It is also possible to:**

- > Select different supply voltages
- > Select the different methods of starting the compressors with capacitance and/or resistance
- > Insert reverse-pressure

**THE SYSTEM**

The system is mainly composed of:

- > a PC for control, acquisition and evaluation of the tests
- > pneumatic circuitry
- > sensors
- > conditioning and acquisition boards
- > HR 100 rack for the insulation test

Through the Vibration Test the system is able to detect faulty compressors due to different constructive and assembly defects such as plays, compressor shocks, missing springs and suspensions.

The testing device is intended to look for vibrations determining a large gamma of noises different from each other both for amplitudes and for frequencies.

It is possible to detect defects in the production line both when the compressor is assembled and when it is still open.

This is very important as the compressor can be repaired before it is closed

In order to measure vibrations, a quartz accelerometer is used, applying it to the external structure of the compressor. The measurement takes place during the sequence of tests listed above. preferably

at the start-up of the compressor.

The analog signal acquired from the sensor is amplified and then digitalized. At this point the signal is analyzed both in the time and frequency domain.

In order to detect the different defects, the system uses a special software based on Pattern Recognition, reaching 100% success in the classification of the compressors. An added benefit of the developed software is the capability to detect some of the defects during the transient phase of the compressor start-up using the appropriate Signal Processing techniques.

The software has been developed using LabVIEW® and among the different capabilities there are:

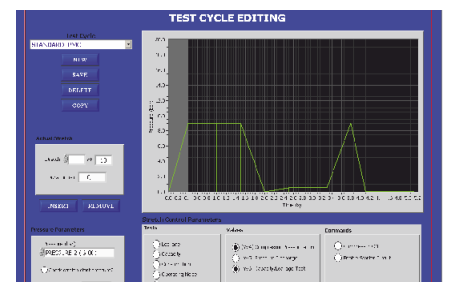
- > Test parameter configuration
- > Test result visualization
- > Interface with PLC
- > Production statistic analysis
- > Vibration signal analysis
- > Automatic classification



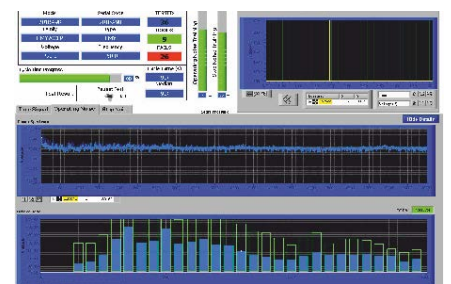
1. Test statyon



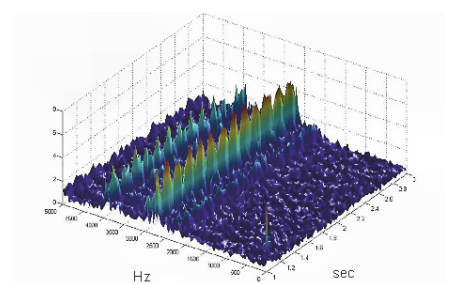
2. Control panel



3. Testing sequences editing



4. Time based analysis



5. Frequency time domain, noisy compressor