



APPLICATION EXAMPLE

**ECOsine™ Active**  
**Increased reliability in the**  
**paper industry**

 **SCHAFFNER**  
energy efficiency and reliability

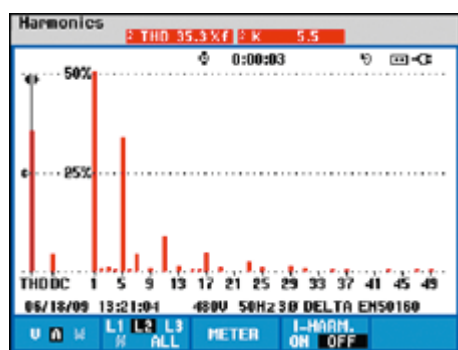
# ECOsine™ Active – Increased reliability in the paper industry

## Improving system reliability step by step

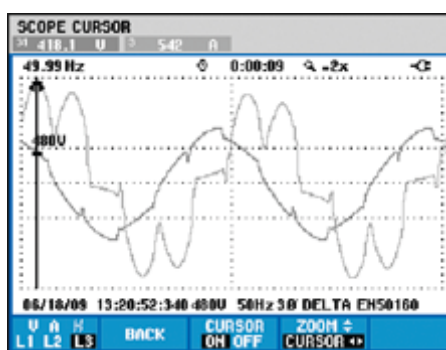
Nowadays, the paper and pulp industry is interlinking intelligent hi-tech machines to highly efficient production lines. Higher power DC and AC motor drives perform the automation tasks. Every kind of interference that negatively affects the reliability and safety of the installation may lead to production downtime and consequently to significant financial losses.

## Paper mill for the production of corrugated raw paper

AC and DC motor drives are so called non-linear loads as they draw a non sinusoidal current from the grid. Resulting harmonics of current and voltage can interfere with the operation of nearby consumers and overload the electrical infrastructure. In this particular application, the load cycles of the drives often caused interruptions in the production process because of disturbances coupling into the fieldbus system.



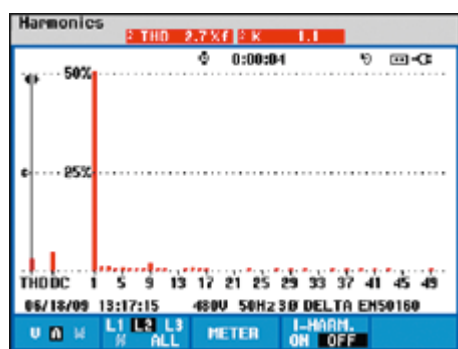
Harmonic current spectrum without filter. THID: 35.3%



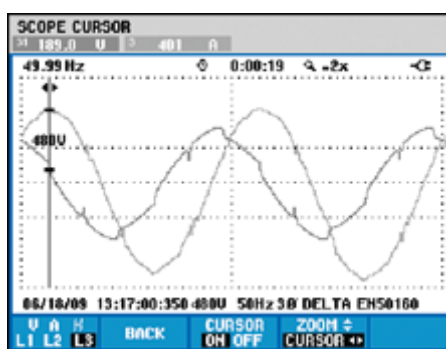
Current and voltage waveform without filter.

## ECOsine™ Active – stepwise less disturbances

Active harmonic filters from Schaffner with a total compensation current of 150A solve these particular problems. In order to ensure maximum availability, three FN 5420-50-480-3 filters were installed in parallel and operated with a 480/525V matching transformer. The incremental connection of the filters leads to a clear and verifiable reduction of Power Quality related interruptions. The compensation of this relatively small part of the entire installation already resulted in a reduction of the voltage distortion THVD of 1.3 percentage points.

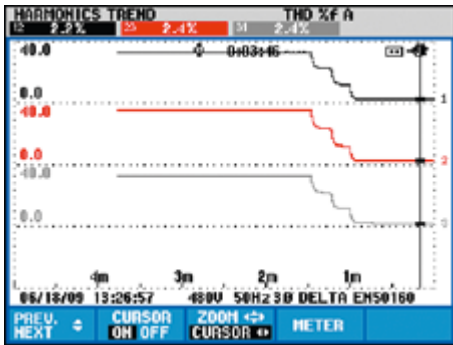


Harmonic current spectrum with filter. THID: 2.7%



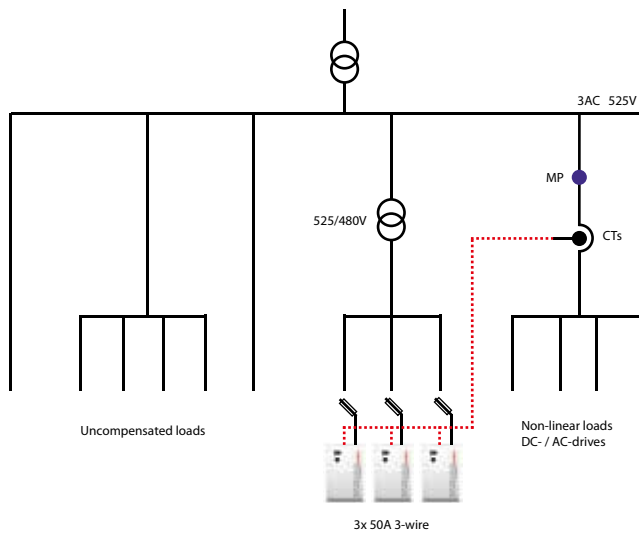
Current and voltage waveform with filter.

The paralleling of 3 filters ensures maximum availability and redundancy and allows selecting the desired degree of harmonics compensation. The effect of the active filters when connected incrementally is visible in the following screen shot.



Level of THID during the incremental connection of 3 ECOSine™ Active filters.

The dynamic compensation of the noise source with Schaffner ECOSine™ Active harmonic filters eliminates all issues with the equipment and the fieldbus system. The reliable operation of the paper mill is therefore guaranteed.



Block diagram of the installation with 3x ECOSine™ Active FN 3420-50-480-3.



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