



Elevator Maintenance with an Oscilloscope

Safety & Standards

According to the French Federation of Independent Elevator Experts and Certification Agencies (FIEBCA), there were 450,000 elevators (lifts) in France in 2010, with 50 % of them more than 25 years old and 25 % more than 40 years old. Today, those figures continue to grow and compliance with the standards is not always achieved in time. Systems like this need to be overhauled regularly and it is even more crucial when they start to age. France is one of the countries in the world with the most elevators, just behind Italy, the United States and China. **This means it is important to check these installations and ensure they comply with the standards in order to avoid accidents and guarantee user safety.**

In this context, the French regulations impose frequent overhauls of elevators. Regular inspections must be carried out every six weeks, the condition of the cables must be checked quarterly and the safety gear, pulleys, speed limiter and limit sensors must be verified annually. In the event of non-compliance with these regulations, installation owners may incur fines if they are inspected.

This case study presents the measurements which can be performed for elevator maintenance with a Handscope® oscilloscope.

Safety

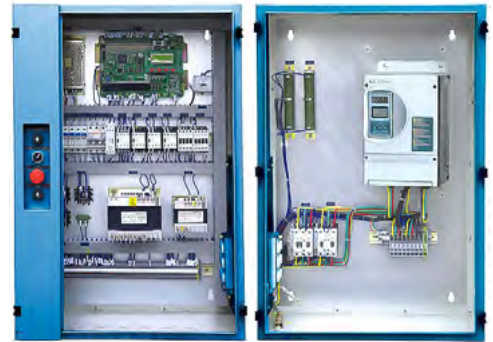
Testing

Monitoring

Elevator maintenance with an oscilloscope

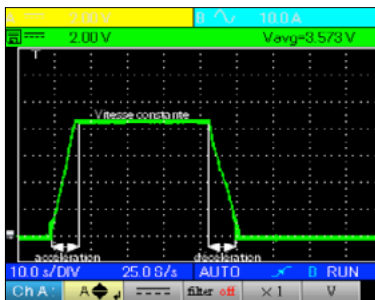
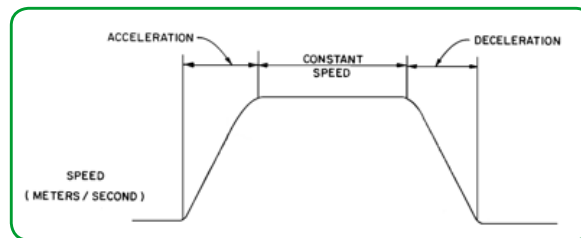
Compliance with standards

The modernization of existing installations is opening up a whole new market for maintenance. One of the main advantages of such modernization is that it does away with the machine room in order to gain space while reducing the number of maintenance operations necessary. Frequent checking remains necessary, however, to prevent any damage to the installations which might lead to accidents.



Maintenance in 5 steps:

- ▶ Start-up
- ▶ Acceleration
- ▶ Constant speed
- ▶ Deceleration
- ▶ Arrival at the destination



Measurement performed on a model elevator with a Handscope®

From a purely electrical point of view, the various electrical systems around the motor need to be verified to obtain this graph. We use an AC/DC current clamp to measure the motor current which is directly proportional to the speed, as long as the application does not involve a frequency variator.

The various measurements to be performed during this operation concern the following 2 steps:

- acceleration according to a ramp
- deceleration according to a ramp

The Handscope® portable oscilloscope with isolated channels can be used to display all the necessary measurements. In SCOPE mode, it is possible to display the measurements over a 2,000-second period, which represents more than half an hour of recordings. This duration is more than sufficient to monitor a complete elevator operating cycle.

We can then continue analysing the electrical control box by using the HARM mode to measure the harmonics on the mains supply so that we can identify any disturbances. The measurements can be incorporated very simply into a maintenance report by means of the Handscope®'s USB connection and the associated SX-METRO software.

Thanks to its multiple functions, **the Handscope® oscilloscope can be used to check elevator shafts, as well as for numerous other applications.** This instrument is versatile, fits into one hand and offers an excellent quality-price ratio. The Handscope®'s 8.5-hour battery life means you can keep measuring for a whole day without recharging.

With the Handscope®, testing is quick and simple.



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