



What is the operating principle of an XS1 ferrous/non-ferrous detector with materials?

Difference between ferrous product to be detected and non-ferrous product to be detected

Ferrous products: any steel

Non-ferrous products: any metal except steel (brass, copper, etc.)

Caution, non-ferrous does not mean any material (wood, plastic, etc.)

Difference between ferrous sensors and non-ferrous sensors

There are sensors which can detect:

Ferrous metals as a preference (steel, iron)

The sensing distances for these products vary according to the metals to be detected: maximum for ferrous and dependent on a K_m coefficient typical of each metal (value between 0 and 1: $K_m = 1$ for steel)

This coefficient reduces the sensor detection range. For example if $K_m = 1$ for cast iron, it is only 0.25 for copper.

This is the conventional inductive sensor

Both for ferrous (steel, iron) and non-ferrous (brass, aluminium, copper, etc.) metals

The sensing distance for these sensors is the same for both ferrous and non-ferrous materials.

The K_m coefficient is always 1

They are called Ferrous/Non-Ferrous sensors.

The Schneider part numbers are: XS1M18KPM40x, XS1M30KPM40x 18 and 30 diameter sensors respectively and XS7C40KPM40

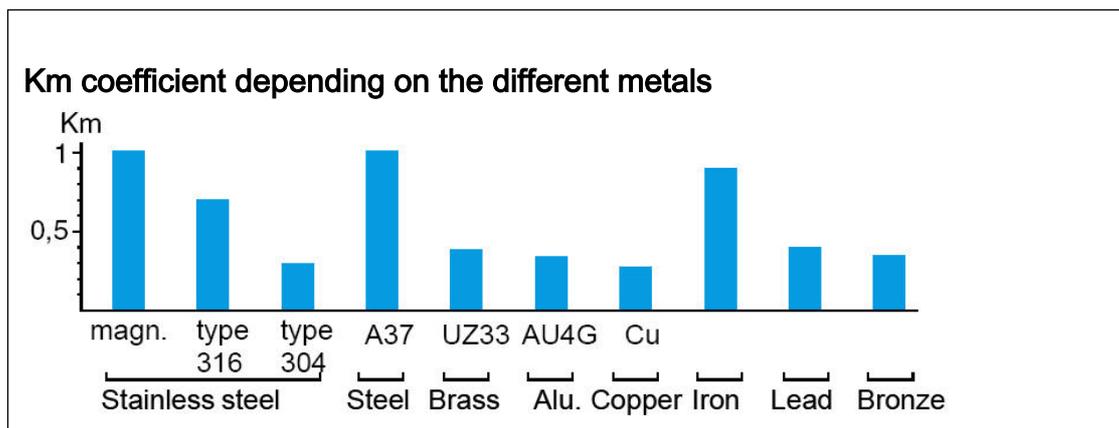
Difference in detection principles

For both sensors, an LC oscillator creates an electromagnetic signal.

The difference in detection principles for the two types of sensor lies in:

Attenuation of the oscillation amplitude for ferrous materials, it is significant for ferrous materials and insignificant for non-ferrous materials

Variation in oscillation frequency for ferrous/non-ferrous materials. For high-frequency operation (in the region of one MHz), both types of material (ferrous and non-ferrous) have the same effect on the oscillation frequency variation.





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