A fast detector is required for the analysis of rapidly changing gas mixtures e.g. from combustion processes or from microbore capillary GC columns.

The presented mass spectrometer is a Mattauch-Herzog type MS, consisting of an electron impact ion source, electrostatic lens, permanent magnet and an array detector. Thus, all ions are displayed simultaneously on a phosphor screen. A standard video camera takes the images, a digital signal processor computes the required information from the video data and transfers the spectra via the parallel port to the personal computer. Spectrum acquisition takes place with 50 Hz. The mass spectrometer with the required pumping system as well as the GC, electronics for control and signal processing and the power supply are mounted in a computer housing and weights less than 20 kg.

Figure 1. Schematic view of the non-scanning mass spectrometer.

Measurements have been performed with this MS-system as a detector for fast GC-analyses and for on-line monitoring of exhaust gases from a combustion engine.

Figure 2. GC-MS analyses of non leaded gas. A part of a series of analyses is displayed. A single analysis takes about 4 s. The substances are separated on a microbore capillary column.