# How does 2-factor early fire detection work in the Kentix SmartPDU?

As a first factor, the measurement of gaseous or vaporous VOCs (Volatile Organic Compounds) offers the possibility of very early detection of incipient fires. VOCs are so-called volatile organic compounds (carbon-containing substances) that diffuse into the air at different temperatures and mix in the room. As many fires in technical systems are caused by electrical defects and in most cases there is slow, localized heating, there is also increased volatilization of substances from the heated materials, especially plastics, paints and varnishes, into the environment. A sudden deterioration in the air quality in a typically closed room, such as an IT rack, server room, electrical distribution board or similar, can therefore indicate a technical defect. The advantage is that VOCs usually mix quickly with the room air and can therefore be measured anywhere in the room.
The room size and the time course of the measured value change play an important role here and must be evaluated in conjunction with other parameters.

The second factor is the measurement of the temperature rise over time and an upper limit value as a so-called heat warning (60°C). In addition to the pure threshold value measurement of the temperature, the time component is also taken into account here, i.e. how quickly the temperature rises over an adjustable period of time. A rapid rise indicates critical changes in the environment and may be the result of a fire.

The aim is to provide information about impending fire incidents as early as possible. In other words, to recognize fires in advance so that they can be avoided. This type of fire detection can prevent dramatic consequences for companies or society in critical infrastructures.
The 2-factor early fire detection system works particularly well in closed technical rooms with low occupancy and a normally stable room air environment.

The abbreviation VOC (Volatile Organic Compounds) refers to the group of volatile organic compounds. VOC describes gaseous and vaporous substances of organic origin, i.e. substances containing carbon, in the air.

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