Innovative device-integrated protection helps minimizing business interruptions

Most fires start small. Many fires often remain undetected for a significant time. Fires that have started in electric and electronic devices develop quickly and, uncontained, are way too often causing tragic damage to assets and people. With automatic miniature fire extinguishers and the highly innovative extinguishing bulbs, fires that start inside electronic and electric devices can reliably be detected at a very early stage and effectively extinguished while still small.

Innovative device-integrated protection helps minimizing business interruptions

Business interruptions are the single major risks for companies (Allianz Risk Barometer 2018). In this context, fires are considered a major cause for business interruptions. According to insurance companies in Germany, the risk of fires has increased significantly by 16% in 2018, compared to the previous year. For Germany this means that every five minutes there is a fire somewhere in a business.

The latest statistics of the Institute for Damage Research (“Institut für Schadensforschung” IFS) in Kiel, Germany as well as statistics of the VdS and GdV (German Insurance Associations) show it clearly: more than 30 percent of all fires in Germany are caused by electronic devices, electric systems and installations, with more than 200,000 residential fires in Germany (GdV 2017) alone. In the industrial environment, this percentage is even higher, and especially in companies such electric fires often bear devastating effects. It is estimated that every third fire in Germany’s industry causes property damage of more than 500,000 Euros, with many companies never recovering from such incidents. Only 23% of all companies affected by a fire are able to completely resume their business. While some businesses can continue, more than 40% of companies ultimately cease trading completely as a direct result of a fire (see “Logistics today”). It is small and medium size enterprises (SMEs) in particular, who often manage fire protection only superficially and just implement the absolute minimum required by local law or code, without being aware of the looming economic consequences.

Typical triggers of electric fires
There are many triggers for electric fires: faulty components, insufficiently soldered joints, manufacturing mistakes, loose plug connections, unintended operating conditions or a simple component failure. All these inherent causes, coupled with rising electrification, play a major role of an increased risk which end-users experience in the form of fires and resulting repairs, production disruptions, product failures and even major recall actions.

Existing protective measures such as residual current switches, contactors or fuses often do not detect a faulty-condition or if they do, it is too late. In addition, many of the sources of such errors cannot directly be influenced by a manufacturer or operator, which is why inherent fire risks often cannot be identified and taken into account. Of course, existing fire protection concepts are already very extensive and are designed to save lives and values through preventive fire protection.

This conventional model of fire protection relies on:

- organizational fire protection, e.g. escape routing and fire protection assistants in companies,
- technical fire protection, e.g. fire alarm systems or smoke detectors
- structural fire protection, e.g. fire doors, sprinkler systems and fire resistant construction materials
- defensive fire protection by the fire brigades and first responders.

Rajko Eichhorn

Rajko Eichhorn is Head of Business Development and Product Manager at JOB Thermobulbs GmbH based in Ahrensburg (Germany). After his time as an aircraft electronics officer with the German Navy, Mr. Eichhorn worked with global companies, mostly in electronics and safety solutions. Mr. Eichhorn is an electrical engineering graduate and holds an MBA from Manchester Business School.
By looking at the above-mentioned statistics, however, it becomes obvious that even with all the existing regulations, it might be advisable – in addition to the legally required minimum – to opt for an extended, so-called “device-integrated fire protection”. Device-integrated fire protection allows fires to be rapidly detected and extinguished where it starts, typically inside a device. Thus, the detection and extinguishment of a fire takes place at the earliest possible time, directly at the place of origin, while such a fire is still at an early stage.

Device-integrated fire protection saves lives and values
A working sprinkler system is the most effective way of preventing large-scale fires from occurring and spreading. They are designed to save lives. There are tragic negative examples, unfortunately, like the fire in the Grenfell Tower in London (June 2017) or the horrible fire in a shopping center in Siberia (May 2017) where fire sprinkler systems were not present or operational. The question remains, what has caused these fires?? Fire investigators found that both tragedies were started by a simple faulty electrical device. There are many examples found in the global news daily: buildings, companies, wind turbines or trains – fires, triggered by electrical equipment and systems, happen frequently!

A cost effective approach to reducing these incalculable risks are stand-alone, thermally triggered automatic miniature fire extinguishing units (AMFE) and extinguishing fuses (E-Bulbs) developed and manufactured by company JOB Thermobulbs in Ahrensburg near Hamburg (Germany). These economic AMFE can be retrofitted easily into existing electric equipment and systems, providing instant reliable device-integrated fire protection. The fire detection is carried out using the same activation principle as a sprinkler – with its own VDS-approved thermo-glass ampoules. Due to the increasing heat in a device, in case of a fire, the temperature-configurable thermo-ampoule bursts and opens the connected extinguishing cartridge without the need of an electric signal and releases the approved extinguishing agent “NOVEC” (3M) into the device. This highly efficient, gaseous extinguishing agent is non-toxic, non-conductive and residue-free after application – the starting fire is effectively extinguished immediately, directly at its point of origin.

Device integrated fire protection with AMFE inside electric cabinets detects fires reliably and extinguishes at the point of origin. Signal connections monitor the activation.
The effectiveness and reliability of the patented AMFE and E-Bulb has not only been independently verified and confirmed by UL (the E-Bulb product line is fully UL listed), TÜV and the German VDE as well as other independent test laboratories, but also by manufacturers and users around the world.

Conclusion
The innovative device-integrated fire protection approach provides many advantages for users:

- Enhanced protection for employees, customers and the general public
- Reduced risk of business interruption (accepted by insurance companies)
- Minimizing possible damage in the event of a fire to the interior of the equipment in which installed
- Acceleration of approval processes or meeting approval criteria easier & more cost effective
- Reduction of follow-up costs by avoiding triggering of other, larger extinguishing or sprinkler systems (avoiding water damage or extinguishing agent replacement costs)

“Device-integrated fire protection”, which detects and fights electric fires at the actual point of origin, provides significantly increased fire safety beyond what is required by existing code. With limited economic effort, this scalable fire protection method helps business and the public alike to minimizing their risks. It is not meant to replace large-scale extinguishing systems, but device integrated fire protection with AMFE and E-Bulb complements the traditional fire protection concepts, and can help making electrical devices, appliances and systems even safer – for the benefit of everyone!

For further information, go to www.job-group.com

References
1 Allianz Risk Barometer, 2018 https://www.agcs.allianz.com/assets/PDFs/Reports/Allianz_Risk_Barometer_2018_EN.pdf
SMALLEST FIRE EXTINGUISHER IN THE WORLD

Device Integrated fire protection
with AMFE and E-Bulb helps mitigating inherent fire risks of electronic devices and electric cabinets

E-Bulb:
- Extinguishes the fire with 3M NOVEC engineered agent!
- Directly in the device, on a PCB!
- Interrupts the electricity (no re-ignition)

Positive contribution for TCO
- Safer products – Completing the traditional fire protection concept on product level
- Approbation advantages
- Cost saving – Lowering the risk of product recalls and product recall costs

AMFE:
- Reliably detects, extinguishes and monitors
- Fighting starting fires at the point of origin – INSIDE electric cabinets
- Uses certified engineered 3M NOVEC agent

Benefits to the user and manufacturer:
- Easy to retrofit into existing installations
- Certified and approved solution for small electric cabinets or machines
- No collateral damage in case of activation: clean, non-toxic, non-corrosive, nonconductive
- Most economical fire protection solution for small enclosures of up to 1.55m³ / 55ft³

For further information about this and our other innovative fire protection solutions, please contact JOB by email at sales@job-group.com or via our website at www.job-group.de