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## Detecting and preventing sparks

### DART introduces a totally new way of explosion protection

**Intrinsic safety also means limited power supply. At least according to the present state of technology. Dynamic Arc Recognition and Termination (DART) is going to eliminate this restricting factor. This new technology is based upon a totally new approach to explosion protection and will allow solutions providing up to 50 watts of usable energy.**

Intrinsically safe system designs (Ex i) primarily rely on the limitation of the available effective power to less than 2 watts in order to prevent the built-up of sparks that might cause an ignition within explosion hazardous areas.

DART, however, allows to use field devices with a power rating of up to 50 watts even within an Ex rated area. This is possible, because DART is able to detect failures of the electric system right from the beginning and quickly shuts off the power supply before any critical situation can arise.

The basis for such early detection is the fact that any spark leads to a sudden peak of the current and voltage within the respective electric circuit. This peak shows a very specific characteristic which DART is able to detect and switches off the circuit in case of any spark formation, before the current is able to reach a level to build up sufficient heat for ignition.

DART is available in two versions. DART High-Power allows the use of devices with a power consumption of up to 50 watts inside the Ex area. Typical examples are industrial PCs including control terminals and displays, LED lighting systems, sensors with high power rating, instruments for analysis and solenoid valves.

Via a Fieldbus infrastructure, DART is able to provide up to 8 watts of electric power per segment even inside explosion hazardous areas.

## **Elimination of distortions**

Factors, such as cable length and device characteristics can greatly influence the response time for spark detection. DART deals with such negative influences by connecting the device via a decoupling module to the energy supply. This module ensures a clearly defined electrical response pattern, always providing the DART system with a signal that allows the dependable detection of critical situations requiring immediate shutdown of the circuit.

## **Enabling technology of a new generation**

Presently, DART is in the latest stages of its development. Insiders view this system as the enabling technology to start a totally new era in process automation. It will eliminate the negative aspects of present intrinsically safe solutions, thereby offering the process industry an impressively wide range of new applications.

Pepperl+Fuchs is one of the driving forces behind the development of DART. The company is now planning to introduce this technology on the market and is looking for suitable partners to develop new products and applications. "We are interested in a constructive dialogue with product managers from all over the world," stated Michael Kessler, director of the company's business unit Components and Technologies.

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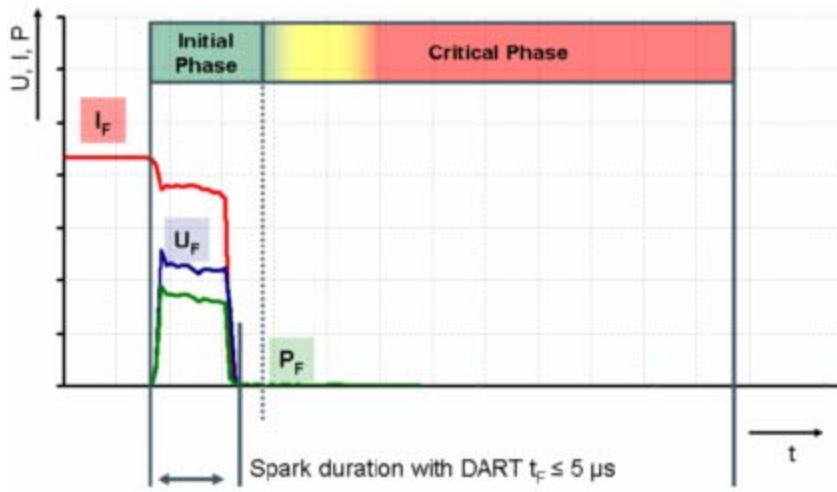


Fig. 1: Electric behavior of a spark turned off by a DART-Power Supply



Fig. 2: Simple DART-Circuit consisting of power supply, cable and load