



POWER ARC REDUCTION TECHNOLOGY



Arc fault protection for medium voltage switchgear systems by high-performance thyristors.



Extinguishes arc faults in less than 2 ms.



Reliable technology combined with an extremely rapid reaction time is required in order to effectively limit the effects of an arc fault within a switchgear system. KÖHL unites both requirements by introducing its new Power Arc Reduction Technology System **PART** which combines the physical basis of speed of light with the latest research knowledge in the area of power electronics.

The combination of light detection through point sensors and the detection of the current rise in the infeed ensures that the **PART-PRO**(tection) actuator is triggered. The triggering signal is generated by the hardware and software of the **PART-LOG**(ic).

The individual assemblies in the whole system communicate via a CAN-Bus. This ensures a fast and secure data transmission. Through the pending signal at the gate the junction layer of the thyristors becomes conductive and causes a full short-circuit spanning of all three phases. At the same time a trip signal is sent to the upstream circuit breaker in the infeed. This switches the infeed off, following its device-specific break time.

The entire process from arc fault detection up to triggering of the thyristor takes place within a timeframe of ca. 2 ms. The thyristors remain protected by means of over-voltage conductors located on the switching unit.

Following a quick inspection and removing the cause of error the system is now ready for use again. This innovative protection system has been developed in order to be implemented in KÖHL's withdrawable medium voltage system KMP-A. However, it can also be integrated in systems offered by other brands.

In order to guarantee a maximum level of availability, the protective unit is positioned in a separate cabinet which is directly connected to the switchgear system. This enables the operator to promptly restart the system after the occurrence of an arc fault even without renewing the destroyed actuator - which can be replaced at a later time. In addition to light and current it is also possible to integrate sensors for movement, humidity and temperature into the analysis. This ensures an optimum monitoring of the plant.

Protective system medium-voltage rated values

Protection type	IP 3XD
Rated voltage	12 kV
Rated frequency	50/60 Hz
Rated lightning impulse voltage	60 kV
Rated short-time current	31,5 kA
Service life expectancy	20 years
Actuator switching time	0,05 ms
System switching time	< 2 ms



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