

Medium Voltage Products

FC-Protector

Fault current limiter for indoor
and outdoor standard applications

FC-Protector

Fault current limiter for indoor and outdoor standard applications

The vast global increase in energy demand requires additional power generation and reliable, efficient complex meshed power distribution. A trend towards growing decentralized power production is likely to considerably alter today's grid structure. One of the key challenges for both private and public enterprises is the reliable and economic protection against increasing fault current levels.

The short-circuit withstand capability of electrical systems may be exceeded in case generators or transformers are added, existing power sources are operated in parallel or the system topology is modified. A potential short-circuit fault in the electrical equipment downstream of the circuit-breaker is fed with the combined increased short-circuit current i_{total} (Fig. 1).

The electrical equipment is stressed with the maximum fault current which exceeds the short-circuit withstand capability of the system (Fig. 3). A conventional circuit-breaker requires multiple cycles to clear the fault and is therefore not sufficient to effectively protect the system (Fig. 2).

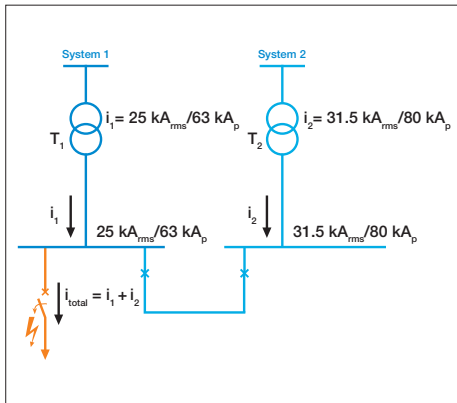


Fig. 1: Short-circuit flows into a fault in the downstream electrical installation

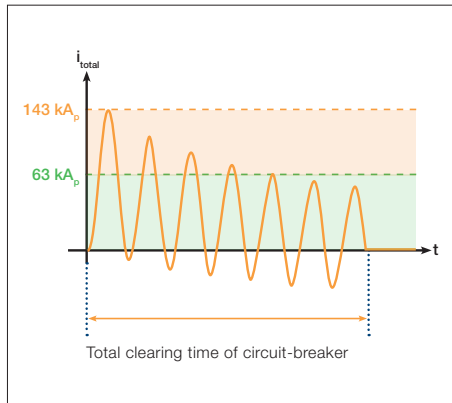


Fig. 2: Short-circuit fault clearing by a conventional circuit-breaker

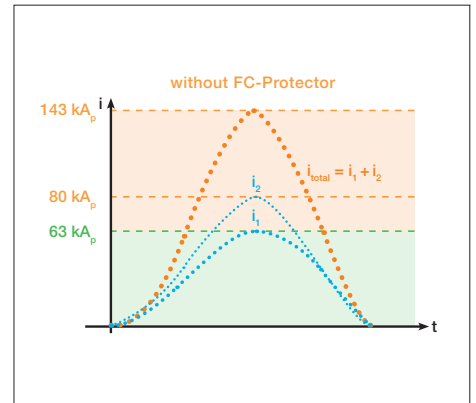


Fig. 3: Detailed diagram of short-circuit fault currents without FC-Protector

The replacement of existing switchgear and cable connections with new equipment of higher short-circuit withstand capability is in most cases technically and economically not viable. ABB's new fault current limiter FC-Protector is the solution for short-circuit current problems in newly installed and existing electrical networks.

The FC-Protector continuously monitors the instantaneous current. In case the total fault current i_{total} , with its respective partial contribution flowing through the FC-Protector i_2 ,

exceeds the application specific current tripping value, the main current path opens. The current will be interrupted by means of the fuses in parallel to the main current path. The very fast current limitation allows the fault current contribution through the FC-Protector to be fully interrupted before the peak short-circuit current is reached (Fig. 6). With the FC-Protector the systems can be operated with a normally closed coupling without affecting each separate system in terms of short-circuit fault level.

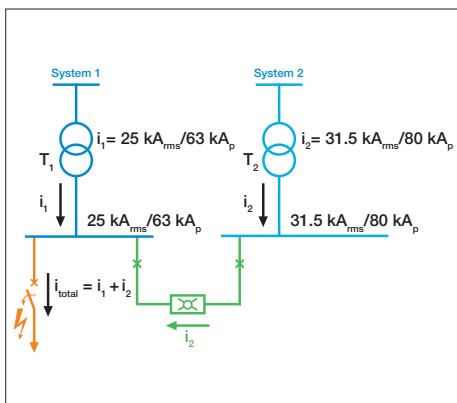


Fig. 4: Short-circuit fault in the downstream electrical installation with FC-Protector

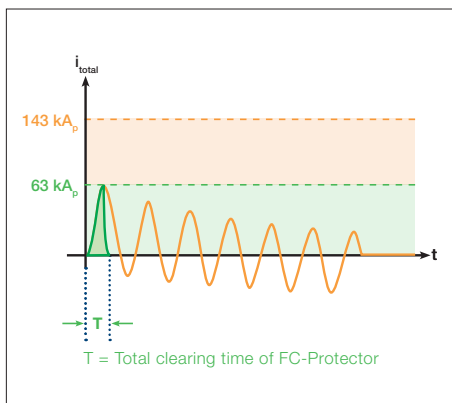


Fig. 5: Short-circuit fault clearing by a FC-Protector

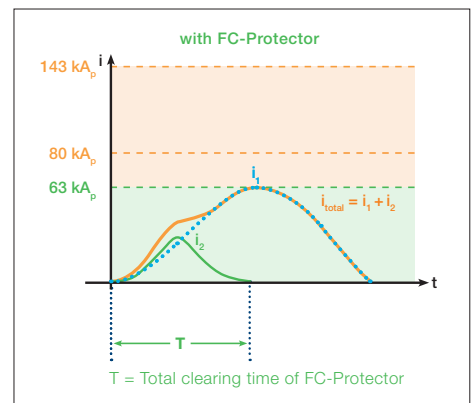


Fig. 6: Detailed diagram of short-circuit fault currents with FC-Protector

FC-Protector

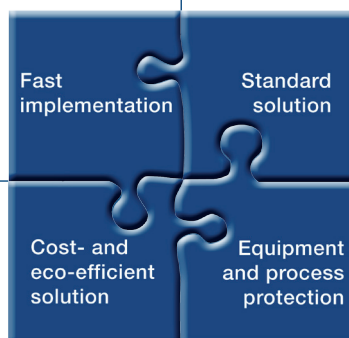
Unbeatable advantages

Fast implementation

- Project related basic engineering according to customer's requirements
- Quick response time based on standardized engineering and documentation
- Short delivery time based on standard components and stock material

Standard solution

- Standardized and compact design
- Fully type tested components
- Flexible use for indoor and outdoor standard applications
- Seismic proof and robust design
- Plug&Play commissioning



Cost- and eco-efficient solution

- Protection of customer's investment
- System extension without replacing existing electrical equipment such as circuit-breaker, busbar or cable system
- Cost- and eco-efficient due to minimization of electrical losses
- Cost-efficient due to minimized system down time
- Downsizing of the system by using lower rated equipment

Equipment and process protection

- Safe protection of...
- electrical installations and equipment
 - processes and systems
 - auxiliary supply in power plants
- ...by immediate separation of the fault affected network

Leading to...

- Minimization of damage by reducing short-circuit current energy and respectively limiting the stress on network components
- Improved power supply by reducing voltage dip

FC-Protector can be used in various configurations:

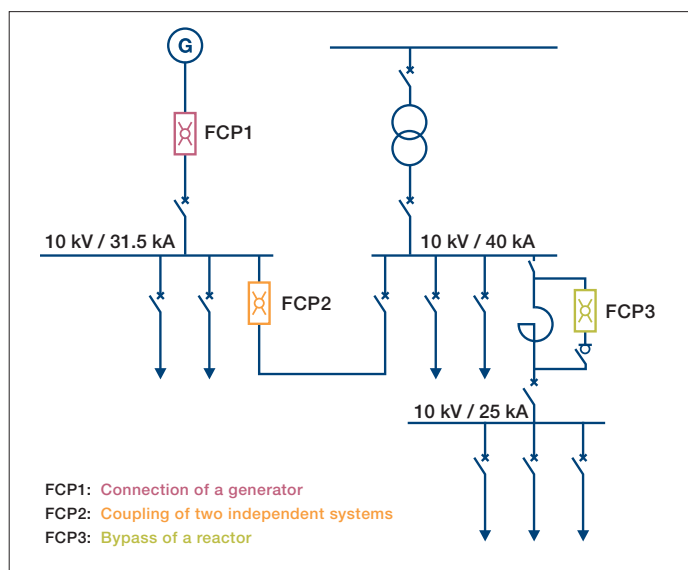


Fig. 7: Application samples with possible FC-Protector solutions

FC-Protector			
Rated voltage U_r	7.2 kV	12 kV	17.5 kV
Rated current I_r	... 2500 A		
Rated short-circuit current I_k	... 63 kA _{rms}		
Rated frequency f_r	50 / 60 Hz		
Application	Indoor / Outdoor (IP 55)		

The wide range of customer segments are:

- High power industries such as paper mills, refineries, chemical industries, steel or aluminium mills
- Utilities such as energy suppliers
- "Green Energy" such as waste heat recovery generation, combined heat production, hydro power, biomass or wind power production

Share your short-circuit problems with us.
We will support you to solve your short-circuit challenge with the FC-Protector.

Contact

ABB AG

Calor Emag Medium Voltage Products

Oberhausener Strasse 33

40472 Ratingen, Germany

Phone: +49 2102 12-0

Telefax: +49 2102 12-17 77

www.abb.com/mediumvoltage

Note:

We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail. ABB AG does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

We reserve all rights in this document and in the subject matter and illustrations contained therein. Any reproduction, disclosure to third parties or utilization of its contents – in whole or in parts – is forbidden without prior written consent of ABB AG.

Copyright© 2016 ABB

All rights reserved

DEABB 2554 16 gb (04_16-500-AMC)