

# Retrofitting Solutions for ABB SF<sub>6</sub> gas HAD lateral circuit breaker

Circuit breaker retrofitting is a cost-effective alternative to the complete switchgear replacement. ABB Service experts conduct site audits on existing installations to assess the condition of the equipment, recommend the proper solution and support the right investment decision.

Retrofit stands for the replacement of phased-out devices by current production circuit breakers which are mechanically and electrically adapted for the existing engineering. The result is a deep improvement on reliability, safety, maintenance and performances.

ABB Service is a full system provider for retrofit solutions, from the proposal and design, through the manufacturing and testing, up to the installation and commissioning.



Original SF<sub>6</sub> HAD circuit breaker

## Benefits

### Reliability

- Significant life time extension
- Lower maintenance requirements
- Long time availability of spare parts.

### Safety

- Strong fault risk reduction
- Additional embedded safety features
- Improved operator protection.

### Technology

- Latest generation apparatus
- Designed according to IEC 62271-100 Standard
- Tested and certified products.

### Project

- Short implementation time for replacement
- Minimum shutdown of the switchboard
- Smooth site activity.

### Investment

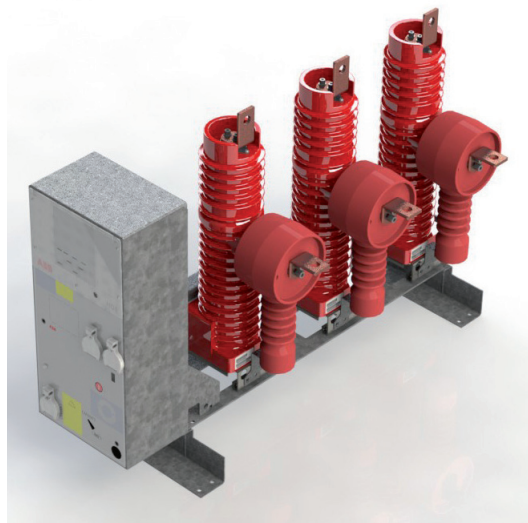
- Limited capital investment
- Minimization of further maintenance costs
- Warranty on the conversion work.

## Facts

HAD is the family name of a wide range of SF<sub>6</sub> gas circuit breakers manufactured by ABB and currently phased-out. HAD installed base includes different solutions fitting ABB and non-ABB panels.

HAD circuit breakers use SF<sub>6</sub> autopuffer quenching technique to extinguish the electric arc.

Specific handling procedures shall be applied during maintenance and performed by certified operators according to EC Regulation 305/2008 and SF<sub>6</sub> gas has to be treated as per EC Regulation 842/2008 in those countries complying with.



HD4 SF<sub>6</sub> gas retrofit

## Technical Data

A full range of retrofitting kits solutions for fixed circuit breakers with lateral operating mechanism have been developed based on the current ABB gas HD4/R circuit breakers. The mechanical and electrical interchangeability between the existing circuit breaker and the new one is guaranteed. ABB proposal provides the best fit for purpose apparatus for each switchgear unit, depending of the complete network equipment conditions and the specific feeder operational characteristics.

The following basic details are necessary for providing standard retrofit solutions:

- Data label technical information and serial number.
- Four sides pictures.
- Compartment inner pictures.
- Existing panel schematic diagram.
- Generator data for the relevant feeders.

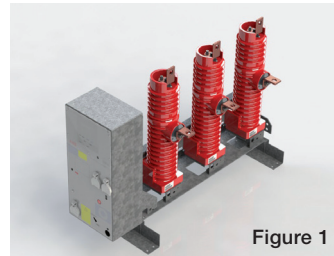


Figure 1

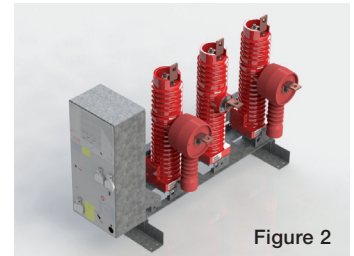


Figure 2

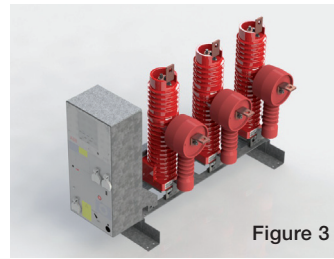


Figure 3

## Ratings

Type	Current sensors	Rated current	Rated short circuit current	Rated voltage	Retrofitting kit
HD4/R-HAD	Without current sensors	630 A	12,5...20 kA	12-17 kV	Kit 1 (Figure 1)
			12,5...16 kA	24 kV	
			25	12 kV	
		800-1250 A	20	24 kV	Kit 2
			12,5...25 kA	12 kV	
			12,5...20 kA	17-24 kV	
	2 current sensors	630 A	12,5...20 kA	12-17 kV	Kit 3 (Figure 2)
			12,5...16 kA	24 kV	
			25	12 kV	
		800-1250 A	20	24 kV	Kit 4
			12,5...25 kA	12-17 kV	
			12,5...20 kA	24 kV	
3 current sensors	630 A	12,5...20 kA	12-17 kV	Kit 5 (Figure 3)	
		12,5...16 kA	24 kV		
		25	12 kV		
	800-1250 A	20	24 kV	Kit 6	
		12,5...25 kA	12 kV		
		12,5...20 kA	17-24 kV		

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