

FACTSHEET

MCR1000 Medium Current Rectifier

5 kA to 200 kA up to 1,000 VDC



Specially developed for the electrochemical and electrowinning industry. The water-cooled medium current rectifier MCR1000 represents reliable technology, including significant features to provide customers with maximum benefits.

— Example of ABB's MCR1000 rectifier

MCR1000 water-cooled

The centerpiece of the MCR1000 is a special designed self-supporting heat sink profile with integrated water channels for most effective cooling. Beside the function as a DC current conductor, it acts also as a mechanical support and mounting area for the semiconductor clamping sets, the over-voltage protection and the thyristor gate firing electronics. The integrated water channels are routed to minimize extensive outside hose connections. All semiconductors and fuses are double sides cooled by high-efficient cooling boxes and the heat sink profile. The MCR1000's modularity and simplicity makes it highly scalable, with high availability and easy maintenance.

Each semiconductor is equipped with a high-speed current limiting fuse for selective isolation in case of a failure. This allows nominal load operation even with one or more semiconductors out of service if requested. The wide range of semiconductor and fuse selection meets the most demanding customer requirements. For long-term stable contacts, all contact surfaces are nickel-plated.

To prevent flashovers in the rectifier caused by failing semiconductors, all of them are equipped with ABB's semiconductor protection ring. Electrically the rectifier is protected against holestorage effect surges and overvoltage disturbances coming from the network by a suitable rated overvoltage protection.

Main technical data

Rated DC voltage	Up to 1,000 V
Rated DC current	Up to 200 kA
Semiconductors	Diode or thyristor 3 to 4 inch types
Semiconductors in //	2-6
Semiconductor redundancy	Yes
Rectifier connection	DB or DSS
Pulse number/unit	6 or 12 pulse
Cooling media	De-ionized water/glycol mixture
Installation	Indoor as IP00 or IP21 (enclosure) Outdoor as IP54 (enclosure or container)

MCR1000 portfolio

Rectifier type	Semiconductors in //	Connection mode	Pulse number	Rated DC current	Rated DC voltage
vertical	2	DB/DSS	6P/12P	5–200 k A*	up to 1,000 V*
	3	DB/DSS	6P/12P		
horizontal	4	DB/DSS	6P/12P		
	5	DB/DSS	6P/12P	* Depends on number of semi-conductors in parallel, connection mode, semiconductor size/type and pulse number	* Depends on rectifier connection mode
horizontal	6	DB/DSS	6P/12P		

Highlights MCR1000

Optimized design to either ensure lowest costs or lowest losses

Upgradable from 3"–4" diameter semiconductors for higher performance or less losses

Common parts shared with ABB's high current rectifier (HCR) series

Flexible design to reach specified customer needs, without overdimensioning

Product features

- Small rectifier footprint
- Wide selection of semiconductors from different suppliers and sizes
- Available for 2 to 6 semiconductors in parallel
- Wide selection of fuses (single or double body fuses) from different suppliers
- Double side water-cooled semiconductors and fuses
- Solid and self-supporting aluminum main-circuit structure
- Vertical and horizontal arrangement available (5 and 6 semiconductors in parallel only available in horizontal arrangement)
- Indirect water cooled snubber resistors
- Applicable for DB and DSS connection types
- Applicable for 6 or 12 pulse systems
- IP00 protection class specially designed for rough industrial environment

Customer value

- **High reliability**
 - Minimized number of components
 - High EMC immunity by optical transmission of gate pulse for thyristors
 - Long-term stable contact surface for semiconductors, fuses and bolted connections by nickel plating
 - Minimum amount of bolted connections
 - Reduced mechanical forces on fuses by ultra-flexible connections between fuses and semiconductors
 - Solid mechanical structure
- **High level of protection**
 - Integrated RC snubber
 - Verification tests of semiconductor fuse performance
 - Effective, fully integrated and separately fused overvoltage and surge protection
- **High level of safety**
 - ABB's unique semiconductor protection ring
 - Mechanical separation of positive and negative DC potential
- **Low maintenance**
 - Minimum amount of cooling hoses by integrated manifolds and water channels
 - Clamping yoke with true force indicator