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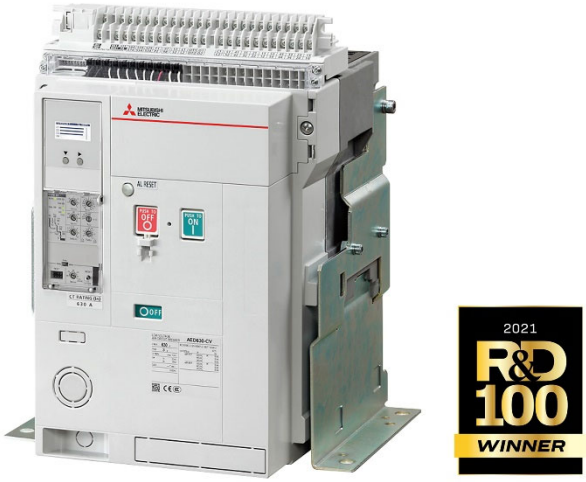
Mitsubishi Electric's Low-voltage Air Circuit Breaker Wins R&D 100 Award

Contributes to Improved maintainability in buildings and factories

TOKYO, December 2, 2021 – Mitsubishi Electric Corporation (TOKYO: 6503) announced today that it has received a 2021 R&D 100 Award from the U.S. publication *R&D World* for its low-voltage air circuit breaker(World Super AE V Series C-class), a switching device that protects low-voltage power-distribution systems in factories and buildings. Including this year's award, Mitsubishi Electric has now won 27 R&D 100 Awards.



World Super AE V Series C-class
low-voltage air circuit breaker

Key Features

Industry's first electromagnetic operating mechanism cuts maintenance costs and energy consumption

- A new high-power electromagnet uses both tapered* and magnetic latch** structures in its movable iron core, realizing the industry's first*** electromagnetic operating mechanism, which requires only the same amount of power as a motorized control.
- Using electromagnetism instead of a spring for the operating mechanism reduces the number of components by 46% and maintenance requirements by 30% compared to conventional operating mechanisms that use a motor and spring, thereby improving maintainability.
- Not having to charge a spring conserves energy by reducing the use of electric power to open/close the circuit breaker by 88%.

* Movable and fixed iron cores, which face each other, are inclined to improve the initial force
** Movable core is held in place until current in the coil is increased sufficiently, which improves the overall force
*** Among low-voltage air circuit breakers (as of December 2, 2021, according to internal research)

Low-voltage power input/output facilities in buildings, factories and renewable-energy facilities must be remotely controllable for enhanced maintenance and operational efficiency. Conventionally, a spring mechanism is used to open and close air circuit breakers, which are a key part of low-voltage power-distribution equipment. To control the circuit breaker remotely the spring must be charged by the motor, which requires the motor drive unit to incorporate large numbers of parts, which greatly increases costs and maintenance requirements.

Mitsubishi Electric's new electromagnetically operated air circuit breaker with tapered and magnetic-latch structures in the movable iron core only requires about the same level of operating power as a motor control, but its operation mechanism contains 46% less components and maintenance requirements are reduced by 30%. In addition, operating the circuit breaker directly with an electromagnet eliminates the need to charge a motor spring, thereby slashing electric power needed to open and close the circuit by 88%.

Mitsubishi Electric, having now won another prestigious R&D 100 Award, is committed to driving the development of next-generation power switching devices in order to continue delivering products that customers can use safely and securely in their electrical facilities.

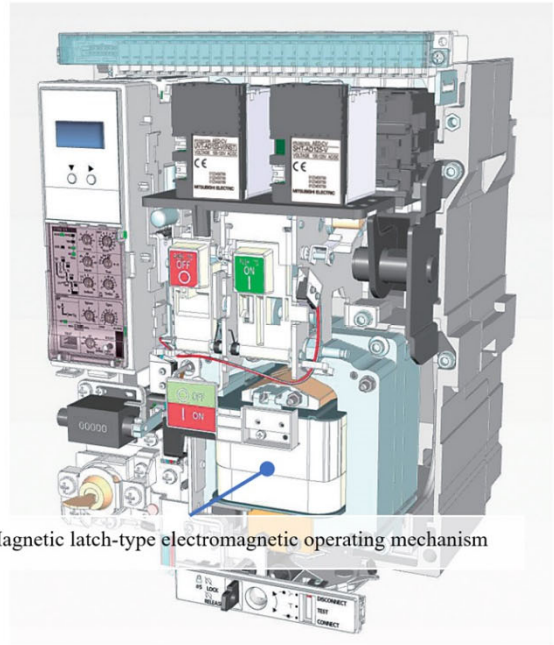


Fig.1 Internal structure of low-voltage air circuit breaker

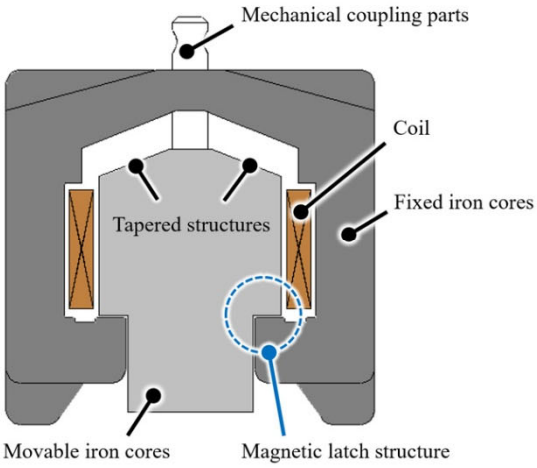


Fig.2 Magnetic latch-type electromagnetic operating mechanism

About R&D 100 Awards

R&D World has bestowed its prestigious R&D 100 Awards on 100 world-class technologies every year since 1963. Professional consultants, university academicians, industry researchers and other experts openly nominate technically important, original and useful technologies. Winners are selected from among those technologies that have been put into practical use in the previous year.

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About Mitsubishi Electric Corporation

With 100 years of experience in providing reliable, high-quality products, Mitsubishi Electric Corporation (TOKYO: 6503) is a recognized world leader in the manufacture, marketing and sales of electrical and electronic equipment used in information processing and communications, space development and satellite communications, consumer electronics, industrial technology, energy, transportation and building equipment. Mitsubishi Electric enriches society with technology in the spirit of its "Changes for the Better." The company recorded a revenue of 4,191.4 billion yen (U.S.$ 37.8 billion*) in the fiscal year ended March 31, 2021. For more information, please visit www.MitsubishiElectric.com

*U.S. dollar amounts are translated from yen at the rate of ¥111=U.S.$1, the approximate rate on the Tokyo Foreign Exchange Market on March 31, 2021