

MEDIUM VOLTAGE SWITCHGEAR

BreakMaster™ V

Medium voltage load interrupter switchgear



ABB's Breakmaster™ V solution provides reduced arc flash incident energy levels for customers on their existing MV equipment. This solution includes a fixed-mount IEEE VD4 vacuum circuit breaker (VCB) or a VM1 circuit breaker in the fused compartment of the LIS. Operating in three cycles, the fast-acting VD4 VCB offers an arc flash mitigating solution designed in response to arc flash safety standards.

Breakmaster V offers enhanced safety and increased flexibility including:

- Reduced arc flash levels from the transformer down to the LV system
- Ability to use as a main or feeder device, which can also be part of a line-up including the fusible or unfusible BreakMaster LIS
- Relay options that provide upstream and/or downstream communications
- Maintaining the same footprint as the fusible BreakMaster LIS
- Added reliability and quality of an IEEE-rated, fast-acting, three-cycle vacuum circuit breaker with embedded pole technology
- Protection provided via the latest relay technology, including bus and transformer differential options

For facilities concerned with arc flash safety, the options may seem daunting and costs out of reach. Fuses used by load interrupter switchgear (LIS) to protect transformers in an over-current situation are no longer adequate. Current LIS may provide poor fault current interrupting times, resulting in high arc flash incident energy. Replacing fuses with vacuum circuit breakers solves the problem.

Standards and approvals

- IEEE C37.20.3, C37.20.4 and ANSI C37.57
- IEEE C37.04, C37.09 and ANSI C37.54
- UL and cUL
- IBC 2021 and CBC 2022

Note: BreakMaster V includes low voltage control wiring from the VD4 circuit breaker and current transformers to terminal blocks located in the LV compartment. Before energization, contact ABB Field Services or qualified personnel for wiring and programming of the factory-installed ABB Multilin® relay or any customer-specified or provided relays or components.

VD4 circuit breaker

The VD4 circuit breaker is a three-phase AC indoor breaker with 15 kV rated voltage. It is used for control and protection of electrical equipment in industrial and commercial enterprises, power plants and substations. Durable and reliable, the VD4 breaker is especially suited for conditions that require frequent operation.

The VD4 MV embedded pole vacuum circuit breaker (VCB) uses automatic pressure gelation (APG) technology to embed the vacuum interrupter and connection terminals within epoxy resin. The embedded pole technology simplifies pole assembly and provides increased assembly accuracy and quality.

Embedded pole technology also improves the environmental-resistant capability of the breaker. The primary circuit is completely embedded in epoxy resin, which minimizes the risk of insulation fault caused by operating environment conditions, such as dust, humidity, vermin, polluted ambient and high altitudes.

VD4 circuit breaker features

Breaker mechanism

All the mechanical parts of the mechanism are integrated into opening and closing modules individually. The closing and opening modules are universal to VD4 embedded pole vacuum circuit breakers. This design offers reduced likelihood of mechanical readjustment, reducing operation and maintenance costs.

VM1 circuit breaker features

VM1 medium voltage circuit breakers have a magnetic actuator for primary distribution for control and protection of cables, overhead lines, substations, motors, transformers, generators, etc.

Magnetic actuation

VM1 circuit breakers use vacuum interrupters embedded in the poles. The embedded interrupters are particularly sturdy and protect the interrupters against

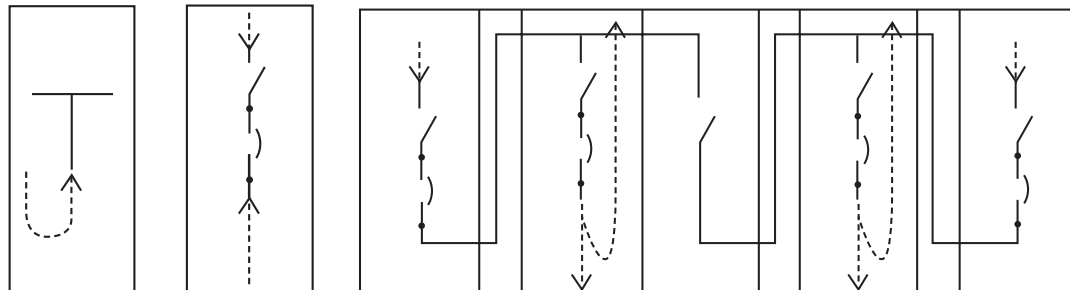
shocks, accumulation of dust and humidity. Each interrupter houses the contacts and makes up the interrupting chamber. The magnetic drive activates the moving contacts of the interrupters and integrates all the functions of a traditional drive. Actuation of the interrupter contacts is carried out by a single magnetic actuator controlled by position sensors and an electronic module. The energy required for operation is provided by capacitors, which ensure an adequate store of energy.

Differential relay options

BreakMaster™ V includes all major components, including the load interrupter switch, IEEE-rated VD4 and VM1 vacuum circuit breakers and the choice of ABB REF/T 615 or Multilin® 350, F35 and MIF II or other specified relay.

Standard configuration features	Single	Line-up
35-inch width	Yes	No
90-inch indoor height, 99-inch outdoor height	Yes	No
50-inch depth standard (includes arrester if required), 60-inch depth available	Yes	No
Available section widths: 55-inch mains/tie; 35-inch branches; 20-inch/35-inch incoming terminal compartments; 20-inch/35-inch/40-inch auxiliary sections	No	Yes
Extension required for oil-filled transformers only (18-inch wide)	Yes	No
Dry type and cast coil transformers require 3-inch throat for outdoor enclosure	Yes	No

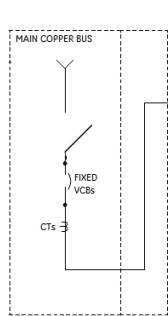
- 01 Incoming
- 02 Single
- 03 Line-up (main-tie-main)
- 04 Single with transition to liquid SST transformer
- 05 Single with transition to dry/cast coil transformer



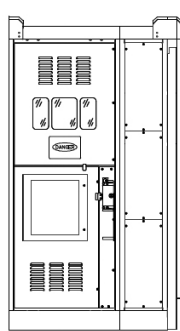
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