SecoVac VB1 Plus

Replacement for
PowerVac Breakers (with ML17/ML18 Mechanism)

5 kV–15 kV | 1200 A–2000 A | 31.5kA / 40 kA

IEEE

AEG Electrical Protection
Safer Smarter Greener

135+ years

AEG

Introduction

The AEG SecoVac VB1 Plus is a precision-engineered, direct-replacement retrofit VCB purpose-built to replace aging Legacy GE PowerVac breakers installed in PowerVac Switchgear —without requiring structural modifications, switchgear retrofitting, or extensive rewiring.

The GE PowerVac switchgear platform has been a workhorse of medium-voltage power distribution across utilities, industrial plants, and commercial facilities for decades. As original PowerVac breakers reach end-of-life, procuring spare parts and replacement units has become increasingly difficult. The SecoVac VB1 Plus provides a modern, fully supported, and code-compliant solution that extends the service life of existing PowerVac switchgear infrastructure — protecting your capital investment.

Designed for GE PowerVac Switchgear

- Drop-in design: dimensions match GE PowerVac switchgear compartment profiles, compatible to existing breaker
- interface kits, equipment interlock system.
- Same secondary disconnect compatible with existing PowerVac, no wiring changes required.
- No modification to existing bus bars, cables, or switchgear structure required
- Rated 5 kV and 15 kV to match most standard GE PowerVac ratings.
- Type tested to both IEC and IEEE standard.

VB1 Plus in GE PowerVac Switchgear

VB1 Plus and Breaker Racked in

Manufactured by AEG to the highest quality standards, the SecoVac VB1 Plus utilizes AEG's latest embedded-pole technology, and GAL front-access spring-charged operating mechanism, delivering uncompromising reliability across the most demanding power distribution environments.

GE PowerVac Replacement Program

About the GE PowerVac Vacuum Circuit Breaker

The GE PowerVac vacuum circuit breaker (VCB) was one of the most widely deployed medium-voltage breakers in North America and globally. Installed in GE PowerVac metal-clad switchgear from the 1970s through the 2010s, these breakers have served reliably in utilities, Oil & Gas, industrial facilities, hospitals, data centers, and transportation infrastructure.

Common GE PowerVac models installed in the field include the 4.16kV, 7.2kV and 13.8kV operation voltage. The PowerVac switchgear platform features 2-High construction with drawout breaker compartments with standardized secondary disconnet connections and mechanical interlocking systems.

Why Replace Aged Breakers?

End-of-Life Challenges with Aging PowerVac Units

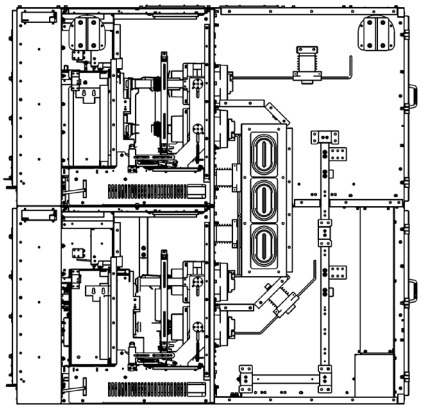
- When PowerVac breakers have reached or are approaching end-of-life — OEM spare parts are scarce and increasingly unavailable
- Aging breaker components may have degraded dielectric strength, increasing arc flash and failure risk
- Worn spring mechanisms and operating coils raise concerns about reliable opening and closing performance
- Obsolete control components are incompatible with modern relay and SCADA systems
- Continued operation of failed or degraded breakers exposes facilities to unplanned outages and safety hazards
- Maintenance and testing costs escalate significantly as components age beyond design service life

The SecoVac VB1 Plus Solution

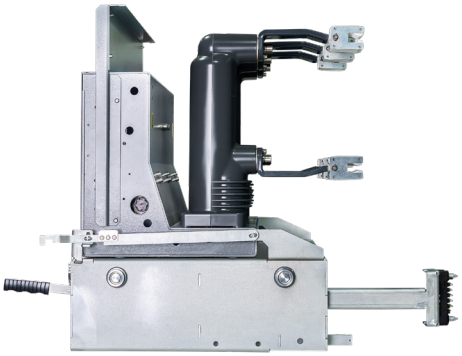
Rather than replacing the entire switchgear lineup — which is costly, time-consuming, and requires extended outages — the SecoVac VB1 Plus enables a targeted, breaker-by-breaker upgrade strategy. Each VB1 Plus unit slots directly into the existing GE PowerVac compartment and connects via the existing control wiring plug, minimizing installation time to a matter of hours per breaker.

This approach dramatically reduces capital expenditure compared to full switchgear replacement, while delivering the performance, reliability, and parts availability of a brand-new AEG-manufactured breaker — backed by a full manufacturer warranty.

GE PowerVac Replacement Program



PowerVac Switchgear Section View



Replacement Breaker

GE PowerVac Replacement Program

GE PowerVac vs. SecoVac VB1 Plus — Comparison

Parameter	GE PowerVac (Legacy)	SecoVac VB1 Plus (AEG)
Voltage Rating	5 kV through 15 kV	5 kV / 15 kV
Continuous Current	1200 A / 2000 A	1200 A / 2000 A
Short Circuit Rating	Up to 40 kA	Up to 40 kA
Operating Cycles	Limited (aging units)	10,000+ mechanical operations
Interrupter Technology	Open Pole	Embedded Pole
Control Wiring	Legacy control scheme	Compatible — no rewiring needed
Secondary Connector	Original plug	Direct plug-in compatible
Interface Dimensions	Reference baseline	Matched for drop-in fit
Mechanism Access	Bottom access	Front-access
Parts Availability	Diminishing / EOL	Fully supported, in-stock
Warranty	None (EOL product)	Full AEG warranty

* Secondary disconnectcompatibility is validated for standard GE PowerVac control wiring schemes. Site-specific verification is recommended prior to installation. Contact your AEG representative for a compatibility assessment.

Key Features & Benefits

Plug & Play — No Switchgear Modifications

The SecoVac VB1 Plus interface dimensions are precisely matched to PowerVac drawout compartment profiles. The secondary disconnect is plug-compatible with existing PowerVac control wiring. Primary disconnect finger clusters connect directly to existing bus stabs. No drilling, cutting, or bus modification is required.

Embedded Pole Vacuum Interruption Technology

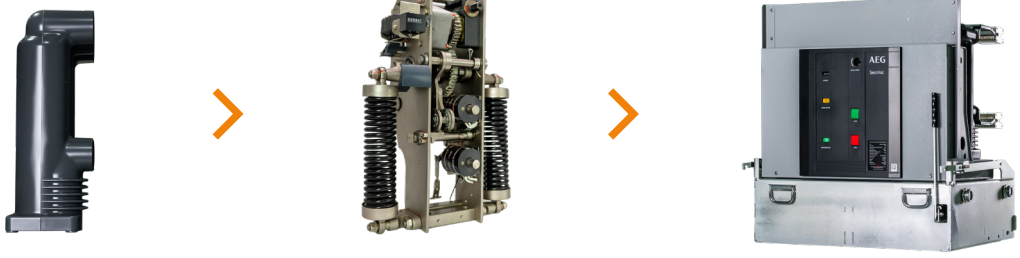
The VB1 Plus utilizes AEG's latest embedded-pole vacuum interrupter design with proven vacuum arc control technology: The vacuum interrupter is designed and manufactured to effectively extinguish the arc within a sealed ceramic vacuum chamber. The specially engineered contact material minimizes chopping current to a very low level without affecting system performance.

The embedded pole design delivers enhanced performance in harsh operating environments, including high humidity, high-altitude installations.

GAL Spring-Charged Operating Mechanism

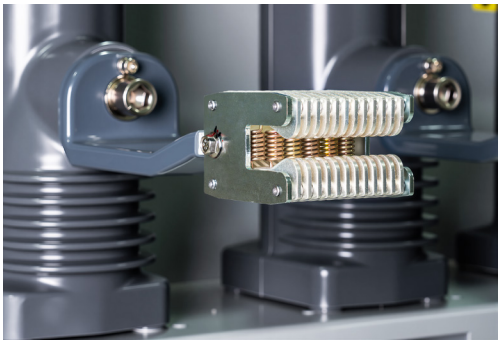
GAL.spring-charging operating mechanism, offering a design life of up to 90,000 mechanical operations. In addition, the GAL mechanism has successfully completed 60,000 mechanical endurance operations during type testing.

GAL mechanism is 100% inhouse assembled, tested., modular design, heavy stainless-steel structure, suitable for voltage range up to 40.5kV, 50kA short circuit breaker breaking capability.



High-Quality Primary Contacts

Primary disconnect finger clusters are constructed from silver-plated copper and rigorously tested for both continuous and short-time current ratings, ensuring low contact resistance and long service life even in high-cycle applications.



Key Features & Benefits

Safety & Interlocking Systems

Keep the same Interlocking System as PowerVac VCB

- Breaker can only be racked between TEST and CONNECT positions with the breaker in the OPEN state — preventing inadvertent energization
- Breaker cannot be CLOSED when in an intermediate position between CONNECTED, TEST, or DISCONNECTED
- Positive mechanical stop at CONNECT and TEST/DISCONNECT positions prevents over-travel
- Metal shutters automatically close over primary stabs when the breaker is withdrawn — protecting personnel from exposed live conductors

Front-Access Design for Easier Maintenance

Unlike the original GE PowerVac breaker which may require rear/bottom access for certain maintenance tasks, the SecoVac VB1 Plus features a front-access mechanism design. All key components — including the operating mechanism module, vacuum interrupters, and control connections — are accessible from the front, simplifying in-field inspection and maintenance without requiring switchgear outage extensions.

Intelligent Status Indicators

Each unit includes a digital operation counter, spring charge indicator (charged/discharged), open/close position indicator, and manual charging shaft — all visible from the front panel without opening the switchgear door.

Technical Specifications

Electrical Ratings

Specification	1200/20	1200/25	1200/31.5	1200/40	2000/40
Rated Max Voltage (kV)	15	15	15	15	15
Rated Continuous Current (A)	1200	1200	1200	1200	2000
Short Time Withstand (kA)	20	25	31.5	31.5	31.5
Peak Withstand Current (kAp)	52	65	82	104	104
Power Freq. Withstand 1 min (kV)	36	36	36	36	36
Lightning Impulse (kV)	95	95	95	95	95
Short Circuit Duration (s)	2	2	2	2	2

Mechanical Characteristics

Parameter	Value
Opening Time (rated voltage)	20 – 50 ms
Closing Time (rated voltage)	30 – 70 ms
Contact Distance	9 ± 1 mm
Contact Travel	3.5 ± 0.5 mm
Closing Bounce Time	≤ 2 ms
Three-Phase Opening/Closing Synchronism	≤ 2 ms
Average Opening Speed	0.9 – 1.3 m/s
Average Closing Speed	0.4 – 0.8 m/s
Main Loop Resistance (1200 A)	≤ 45 μΩ
Main Loop Resistance (2000 A)	≤ 40 μΩ

Technical Specifications

Operating & Environmental Conditions

Condition	Limit
Maximum Ambient Temperature	+40°C
Minimum Ambient Temperature	–25°C
Maximum Relative Humidity	95%
Maximum Altitude (standard)	1000 m a.s.l.
Storage Temperature Range	–15°C to +40°C
Installation	Indoor only

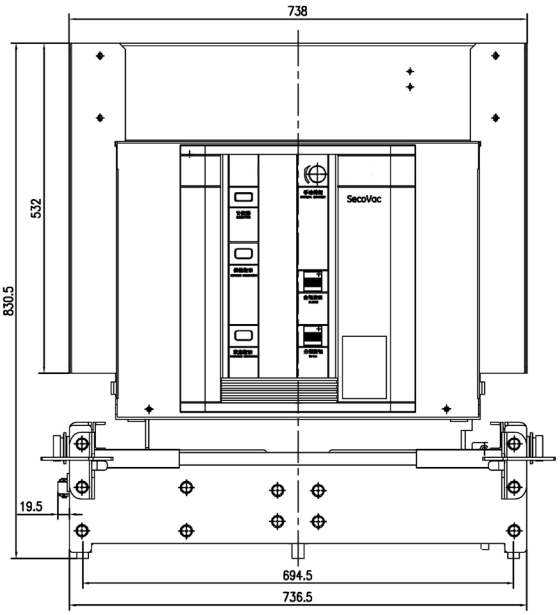
Coil Characteristics

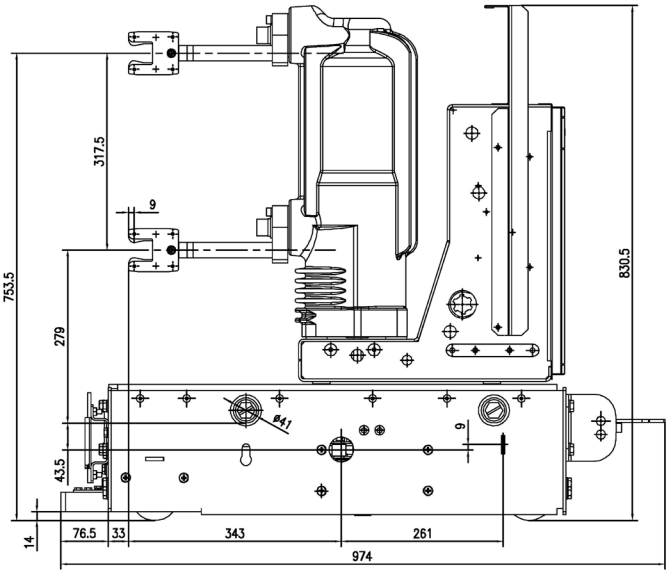
Code	Rated Voltage	Resistance (Ω)	Rated Current (A)
26400066	48 Vdc	6	13
26400135	125 Vdc	50	2.5
26400136	250 Vdc	180	1.5
26400137	120 Vac	50	2.5
26400138	240 Vac	180	1.5

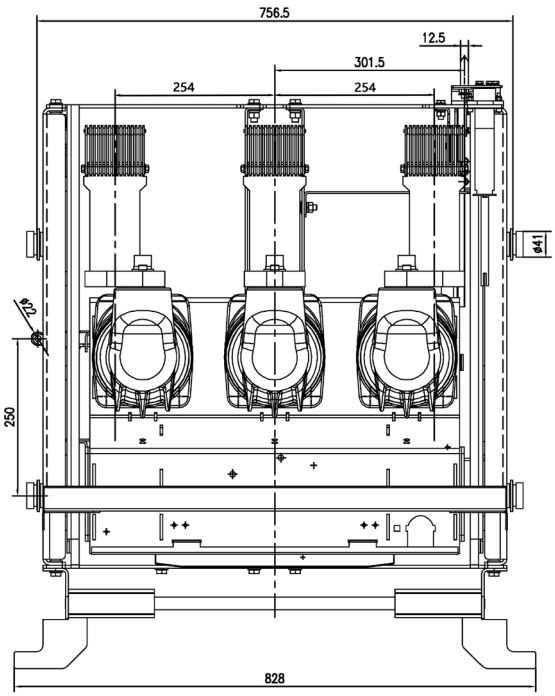
Overall Dimensions

Overall DimensionOverall Dimension

The SecoVac VB1 Plus dimensions are matched for direct drop-in replacement of GE PowerVac vacuum circuit breakers. All dimensions are in millimeters (mm). Verify compartment dimensions against the site survey checklist prior to ordering.



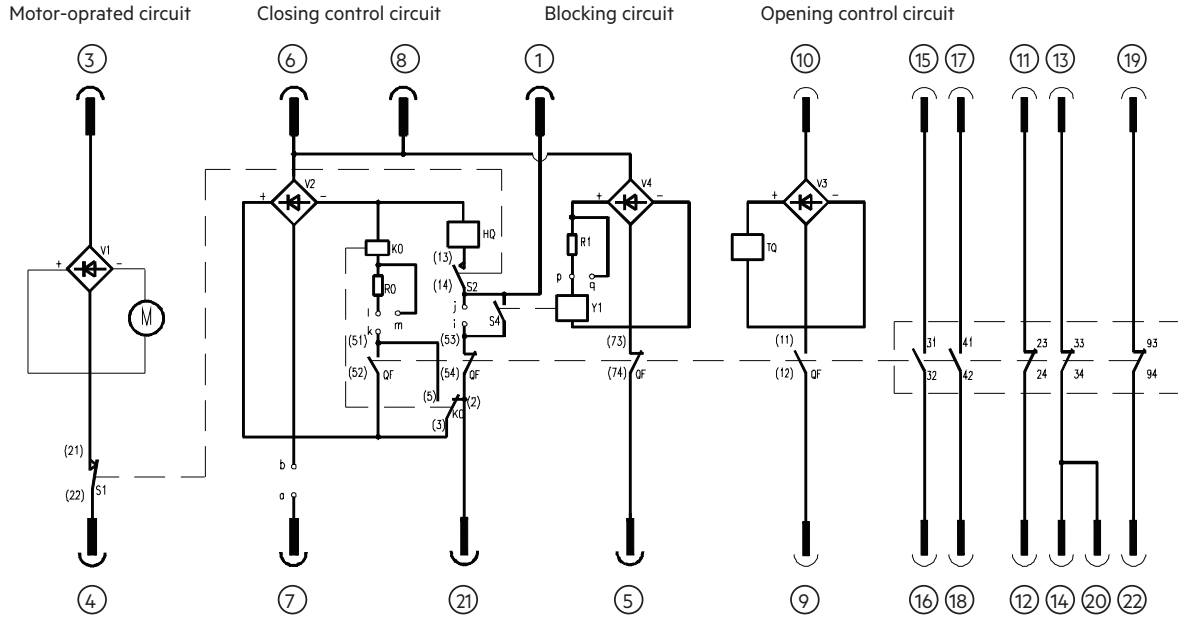




Internal Wiring Diagram

Internal Wiring Diagram

The SecoVac VB1 Plus internal wiring is organized into four functional circuits. The secondary control connector is plug-compatible with the GE PowerVac control wiring scheme, eliminating the need for rewiring in most applications. The table below summarizes circuit functions and terminal references.



Option \ Jumper wire		a-b	i-j	l-k
■ Anti-pumping relay	■ Blocking coil	■	□	■
	□ Blocking coil	■	■	■
□ Anti-pumping relay	■ Blocking coil	■	□	□
	□ Blocking coil	■	■	□

Option \ Jumper wire	p-q	m-l
AC/DC 220V	■	□
AC/DC 110V	■	■

S4: Auxiliary switch for blocking coil	HQ: Closing coil	M: Energy-storage motor
S1-S3: Energy storage position switch	TQ: Opening coil	QF: Auxiliary switch for closing/opening operation
KO: Anti-pumping relay(optional)	RO-R1: Resistance	V1-V1: Rectifier

Remarks:

1. Shown with the stored-energy spring in the discharged, the breaker in open and test pastion.
2. The light grey terminal must be the same pole in DC control voltage.

Control Wiring Compatibility Note

- The VB1 Plus secondary disconnect is designed to be compatible with GE PowerVac control wiring harnesses. In most standard PowerVac installations, no rewiring is required.
- Site-specific verification is recommended, especially where field modifications have been made to the original control wiring.
- For detailed wiring schematics and terminal-by-terminal mapping to GE PowerVac schemes, refer to AEG document section D.2 or contact your AEG application engineer.

AEG

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