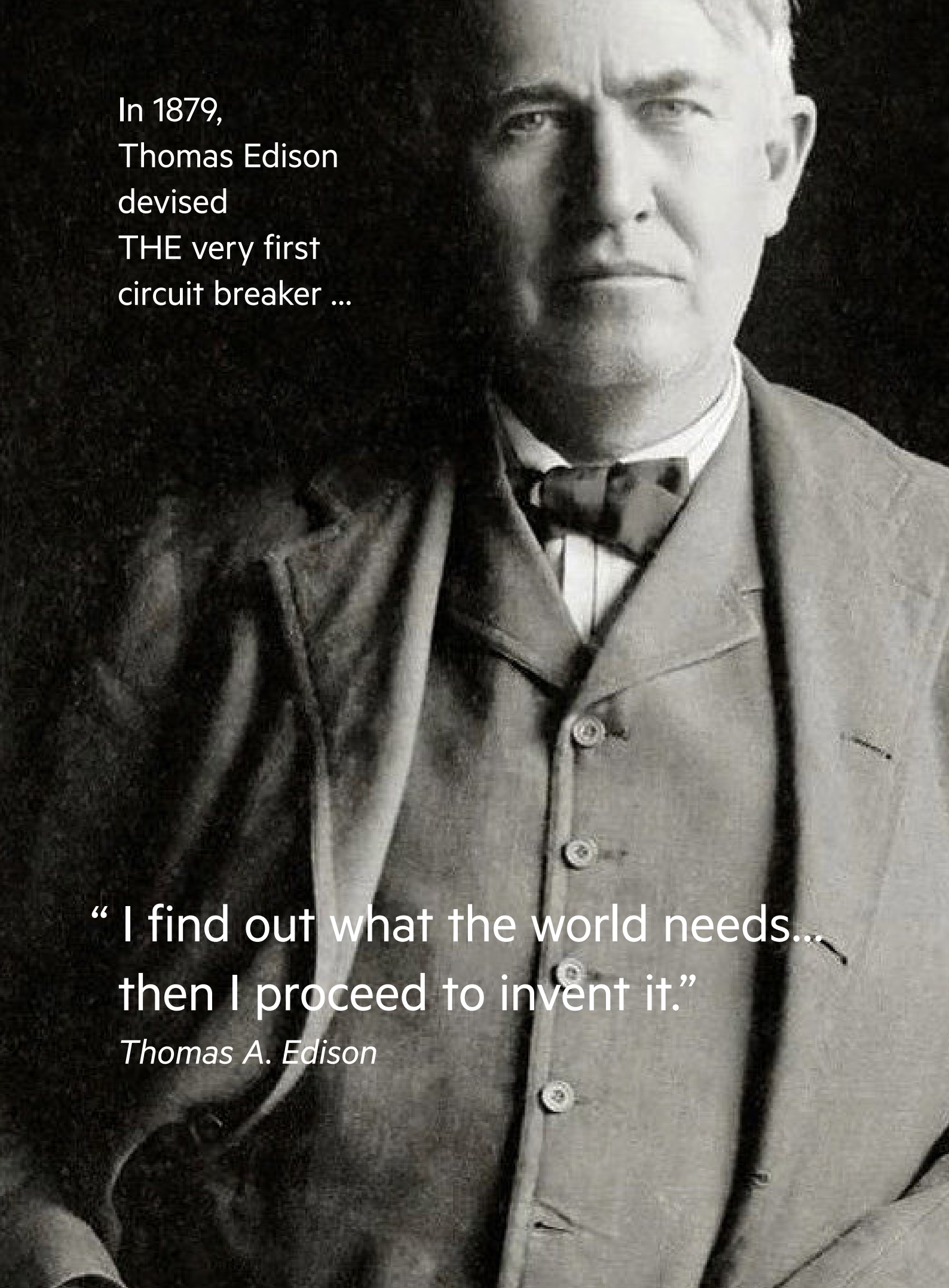
SecoVac

VB2 Plus G-15 Generator Circuit Breaker

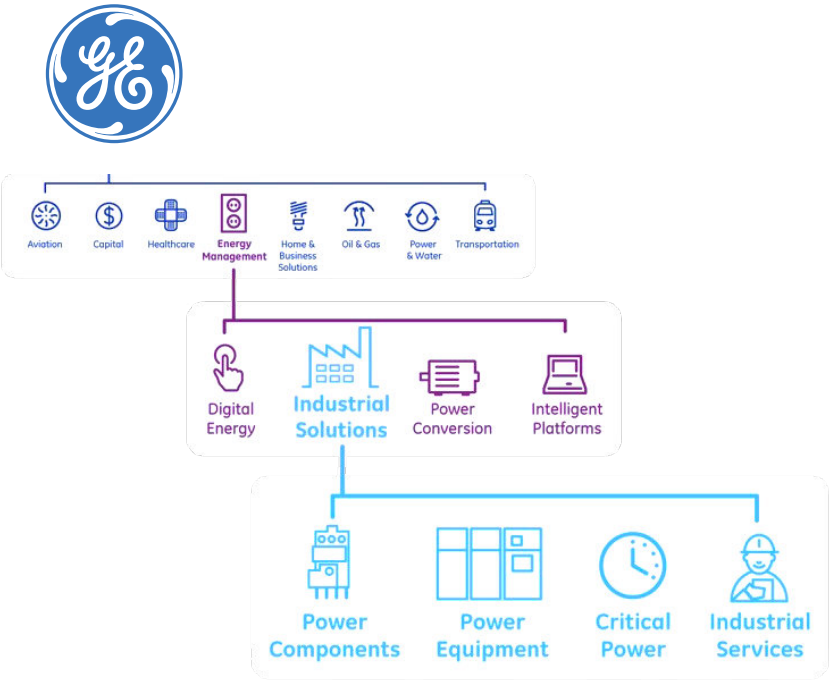
GEIS



In 1879,
Thomas Edison
devised
THE very first
circuit breaker ...

“ I find out what the world needs...
then I proceed to invent it.”
Thomas A. Edison

The “GE Businesses” in 2017



The Proven Technology & Product Lines

SecoVac VCB

MEX ACB

MPACT ACB

Elfa Series MCB/RCBO

SecoGear MV Switchgear

MLS LV Switchgear

WaveCast Transformer

GEIS-Continue the GE Legacy

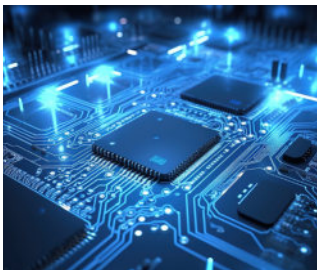
- Spun off of ***GE Industrial Solutions'*** China Business in December 2019
- A key platform for GE's medium and low voltage Electrical distribution & Control (ED&C) product lines: China for China and China for the World
  - Cast Coil Transformers Center of Excellence
  - Global ACB (400-6400A, 100KA), IEC/UL/GB Standard
  - Medium Voltage Equipment and Breaker: IEC, NEMA, GB
  - GE "Global Star Facility"
  - China Technology Center: NPI, Value Engineering
- Leading Technologies
  - Critical Power: ATS, Paralleling Switchgear, APF, SVG
  - New Electrification applications: EV Charging, PCM Energy Storage System
  - Microgrid: Multisource Power Supply, Integrated Energy Center, Ipv6 Compatible Gateway

The Evolution of Business and Brand

Note: GEIS brand is also used in China

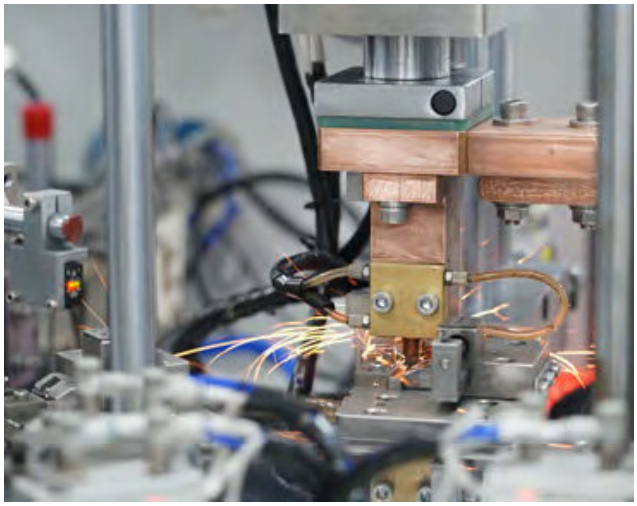
Our Products: From Component to System

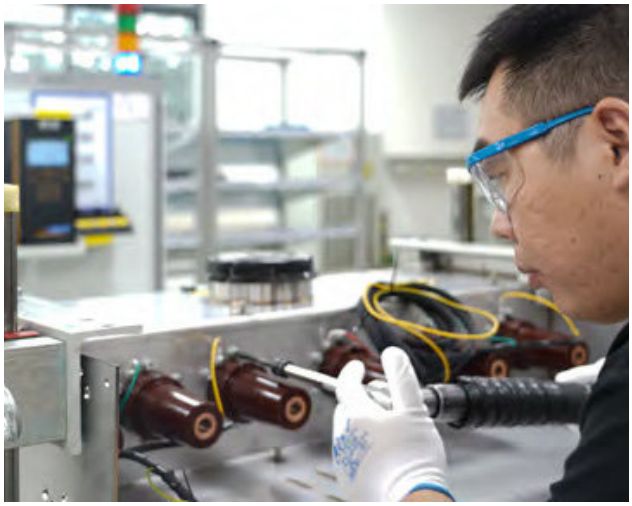
200K+ SKUs & Customized Solution · China, USA, Latin America, SEA, Gulf Region

Electrical Components	Equipment & System	Critical Power	Energy Decarbonization
Innovative technologies for an energy-efficient electrical infrastructure	End-to-end electrical solutions to meet our customer's needs	Power technologies and network solutions for data center & telecom industries	New Electrification Storage Technology
• Structured standard products • Electrical control & distribution • Circuit breakers, modular components, • distributor flow goods • Plug& Play Upgrade kits	• Engineered or configured assemblies • Medium- and low-voltage switchgear, • MV Breakers & Contactors for Industrial Applications • Control equipment, Pwr Transformers, busway & package solutions	• Automatic Transfer Switches • Power Compensation: Active and Reactive • Pallbearing Switchgear, Micro Grid BMS, DC Power Supply	• EV Charging technology: Charger, Platform, Optimization Technology • Distributed Energy Storage technology: PCM Thermal Bank, Control System
			

Our Factory

GEIS headquarter was GE's Shanghai Operation hub, once a GE "Global Star" facility. The factory is upgraded to the latest MES system.





VB2 Plus G-15 Generator Circuit Breaker

Catalog

VB2 Plus G-15 Generator Circuit Breaker

Introduction

The SecoVac VB2 Plus G circuit breaker designed for three-phases AC up to 15kV rated voltage, and can be used for switching and protecting generators in industrial, mining and power plants applications. The product conforms to IEC/IEEE 62271-37-013. The breaker can be installed in the switchgear in fixed or withdrawable arrangements. It is the optimum choice for the control and protection of MV generators.

Service Conditions/ Storage

Normal Service Conditions

- Unless otherwise specified, SecoVac VB2 Plus G circuit breakers, including the operating devices and the auxiliary equipment which form an integral part of them, are intended to be used in accordance within their rated operating parameters and normal service conditions listed as follows.
- The ambient air temperature does not exceed 40℃ and its average value, measured over a period of 24h, does not exceed 35℃. The minimum operating ambient air temperature is -15℃. (storage and transportation is allowed at -30℃).
- The altitude does not exceed 1000m
- The ambient air is not significantly polluted by dust, smoke, corrosive and/or flammable gases, vapours or salt.
- The conditions of humidity are as follows:
  - The average value of relative humidity, measured over a period of 24h, does not exceed 95%
  - The average value of water vapour pressure, measured over a period of 24h, does not exceed 2.2kPa
  - The average value of the relative humidity, measured over a period of one month, does not exceed 90%
  - The average value of water vapour pressure, measured over a period of one month, does not exceed 1.8kPa
- Seismic intensity is not more than UBC Zone 4.

Service Conditions/ Storage

Special service conditions

If the actual service conditions differ from the normal service conditions, the circuit breaker and associating devices and auxiliary equipment shall be designed and made to comply with any special service conditions. This must be discussed with GEIS in advance. Normally, the following special service conditions will be encountered:

- At sites with altitude above 1000m, the effects of the reduction in dielectric strength of the air must be taken into account. GEIS can supply circuit breakers which can be applied in areas less than 3000m above sea level. At this time, the insulation level in the switchgear should be taken into account and must be discussed with GEIS in advance
- The ambient temperature is above 40℃. The rated current of circuit breaker shall be derated or fans shall be installed for heat dissipation. Please confirm with GEIS in advance

Attention

- When circuit breakers are operated in areas with high humidity and/or major rapid temperature fluctuations, there is a risk of condensation, thus
  - Put the circuit breaker into operation as soon as possible after the package is dismantled
  - Turn on the anti condensation heater into service as soon as possible after the switchgear is installed

Storage

- The product should be subject to normal transportation conditions and shall be protected fully from rain and water spray
- Do not store product other than as indicated on packaging. Damage is possible if stored on side/back or top
- If immediate installation is not possible, please maintain original packaging or otherwise similarly protect the product. After inspection and stored, the circuit breaker should be switched off and the spring mechanism should be discharged
- The product shall be stored in dry and ventilated indoor place free of dust severe contamination, chemical corrosion and vibrations. The climate condition conforms to related specifications in IEC/IEEE 62271-37-013 and adequate air circulation shall be maintained. The store room temperature shall not be lower than -30℃. Check periodically to avoid condensation inside breaker

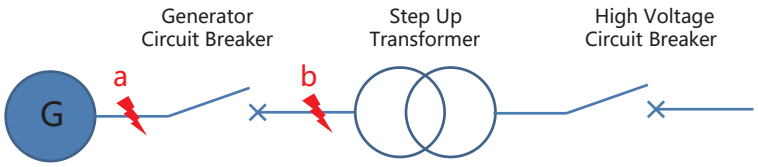
VB2 Plus G-15 Generator Circuit Breaker

Technical Data

Electrical Parameter

Rated short-circuit breaking current	kA	31.5		40		50	
Rated Voltage	kV	15		15		15	
Rated Current	A	2500/3000*/3150/4000**		2500/3000/3150/4000**/5000**		2500/3150/4000**	
Rated Frequency	Hz	50/60		50/60		50/60	
Rated power Freq withstand voltage (1 min)	kV	38		38		38	
Rated lightening impulse withstand voltage	kVp	95		95		95	
Operation sequence		CO – 30min - CO		CO – 30min - CO		CO – 30min - CO	
Generator Circuit Class		G2		G2		G2	
Location of fault (refer below schematic diagram)		**'a' System supplied fault**	**'b' Generator supplied fault**	**'a' System supplied fault**	**'b' Generator supplied fault**	**'a' System supplied fault**	**'b' Generator supplied fault**
Rated short-circuit breaking current	kA	31.5	15.8	40	25	50	25
Rated short-circuit making current: Ipeak	kAp	86.3	34.1	110	54	137	54
Interrupting Time	ms	50		50		50	
Minimum Opening Time	ms	24.3		24.3		24.3	
Degree of Asymmetry	%	75	130	75	130	75	130
Asymmetry interrupting capability	kAp	46	34.1	58.4	36.5	73	36.5
Close and Latch Capability	kAp	86.3		110		110	
Rated short time withstand current	kA	31.5	N/A	40	N/A	50	N/A
Rated duration time for short-circuit	s	3	N/A	3	N/A	3	N/A
Rate of Rise of Recovery Voltage (RRRV)	kV/μs	3.5	1.6	3.5	1.6	3.5	1.6
Peak Recovery Voltage	kV	27	27	27	27	27	27
Out-of-Phase Current Switching							
Duty Voltage	kV	21.2	N/A	21.2	N/A	21.2	N/A
Breaking Current	kA	15.8	N/A	20	N/A	25	N/A
Max. Making Current (V~0)	kAp	31.5	N/A	40	N/A	40	N/A
Rate of Rise of Recovery Voltage (RRRV)	kV/μs	3.3	N/A	3.3	N/A	3.3	N/A
Peak Recovery Voltage	kV	39	N/A	39	N/A	39	N/A
Mechanical life operations	Number	10000		10000		10000	
Center distance between phase	mm	275		275		275	

*3000 is for IEEE market; **4000A/5000A are VCB with force cooling, detail please connect with GEIS person.



Control Circuit Data

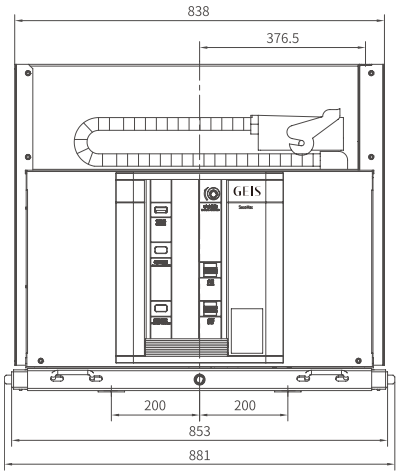
Rated Voltage(V)	Resistance Value (Ω)	Rated Current (A)	Inrush Current (A)	Maximum Power (W)
DC48	3.1	15.5	92.9	743.2
DC125/AC120	45	2.8	16.7	347.2
DC250/AC240	216	1.2	6.9	289.4

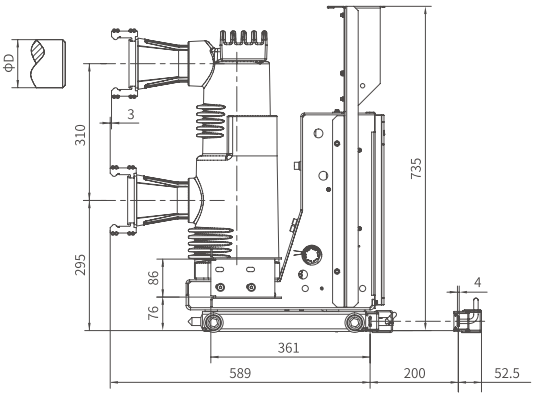
Rated Voltage (V)	Normal Operation Voltage Range (V)	Charging Time at Rated Voltage (s)	Input Power (W)
DC 48	36 - 56	<15s	150
DC 125	90 - 140	<15s	150
DC 250	180 - 280	<15s	150
AC 120	104 - 127	<15s	150
AC240	208 - 254	<15s	150

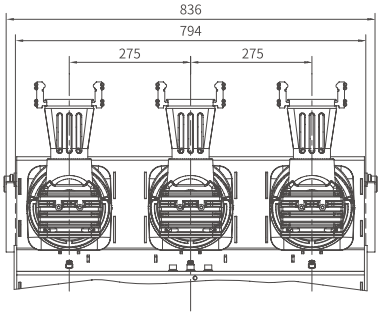
VB2 Plus G-15 Generator Circuit Breaker

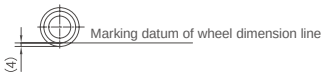
Overall Dimensions

Withdrawable



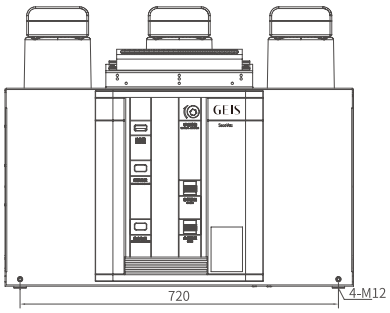


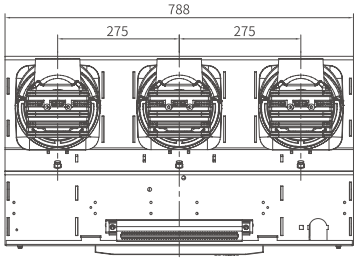


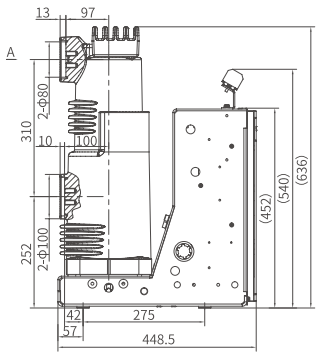


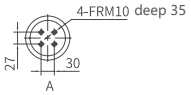
Specifications	D
2500A/31.5~50kA	ϕ109
3150A/31.5~50kA	ϕ109
4000A/40~50kA	ϕ109
5000A/50kA	ϕ109

Fixed







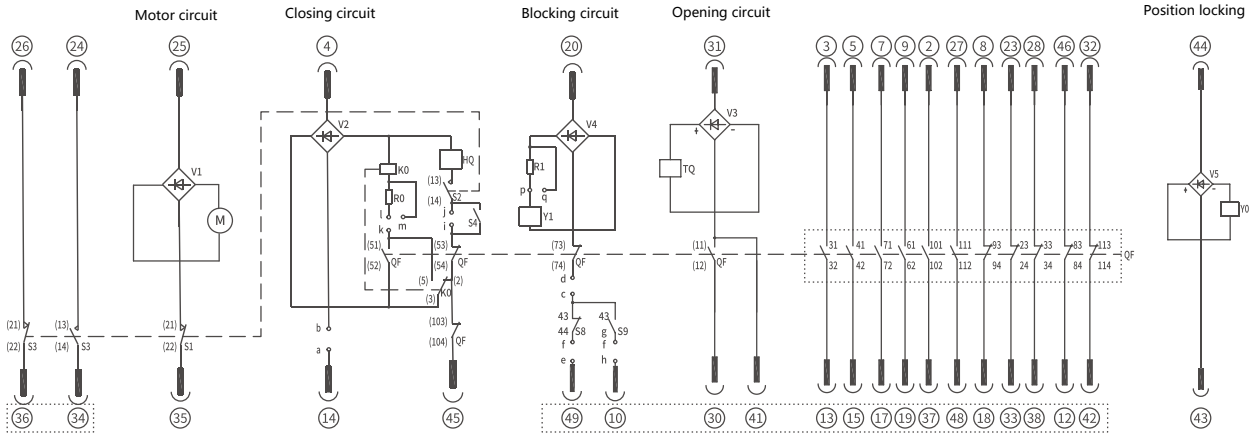


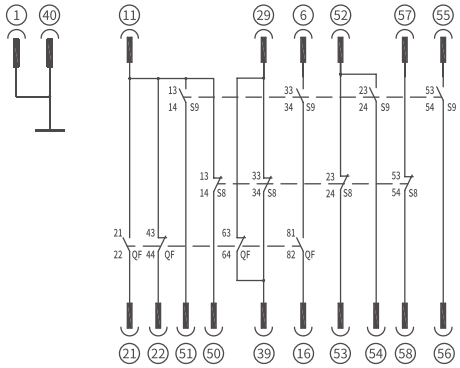
Specifications
2500A/31.5~50kA
3150A/31.5~50kA
4000A/40~50kA
5000A/50kA

VB2 Plus G-15 Generator Circuit Breaker

Internal Wiring Diagram

Withdrawable





Opetation power selection:

Operating power supply \ Jumper	p-q	m-l
AC/DC 220V	/	/
AC/DC 110V	√	√

Remark: "/"means disconnection; " √"means connection

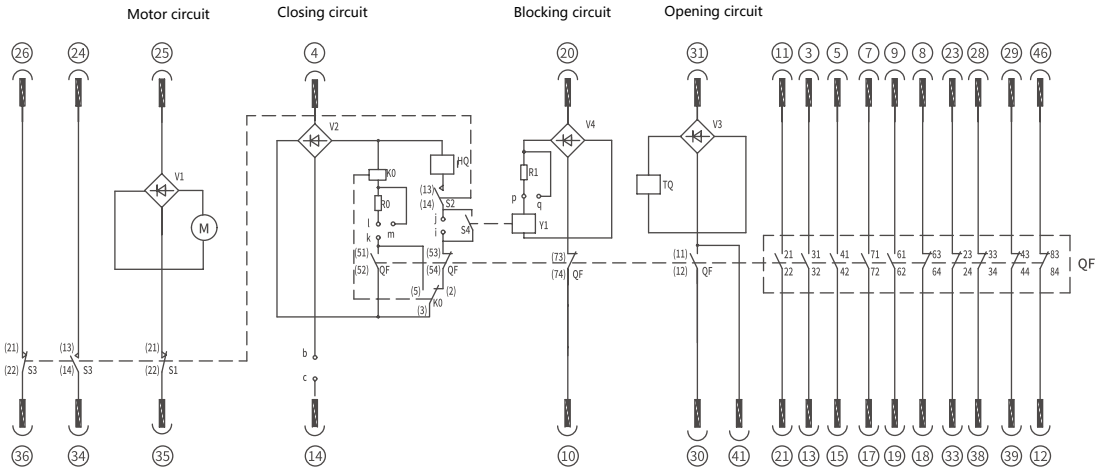
Optional connection settings:

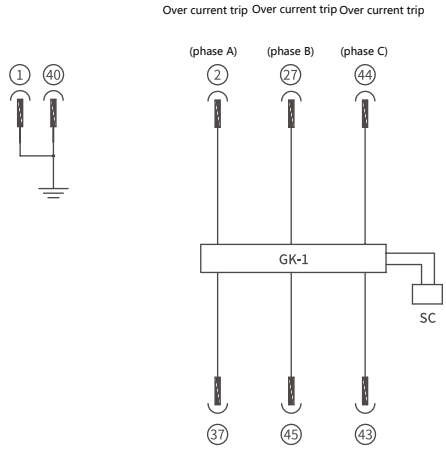
Jumper status \ Jumper / configure		a-b	c-d	e-f	g-h	a-f	a-g	b-c	i-j	l-k
With protection	With locking	√	√	√	√	/	/	/	/	√
	Without locking	/	/	/	/	√	√	√	√	√
Without protection	With locking	√	√	√	√	/	/	/	/	/
	Without locking	/	/	/	/	√	√	√	√	/

S9: Limit switch (service position)	HQ: Closing coil	V1~V5: Rectifier
S8: Limit switch (test position)	TQ: Opening coil	K0: Anti-pumping relay (optional)
S4: Electromagnet for locking's anxiliary switch	R0~R1: Resistance	Y1: Electromagnet for interlocking (optional)
S1~S3: Energy staring travel switch	M: Spring charge motor	Y0: Electromagnet for interlock truck (optional)
QF: Auxiliary switch		

VB2 Plus G-15 Generator Circuit Breaker

Fixed





Opetation power selection:

Opetation power selection: Jumper / Operating power supply	p-q	m-l
AC/DC 220V	/	/
AC/DC 110V	√	√

Remark: "/"means disconnection; " √"means connection

Optional connection settings:

Jumper status / configure	Jumper	b-c	i-j	l-k
With protection	With locking	√	/	√
	Without locking	√	√	√
Without protection	With locking	√	/	/
	Without locking	√	√	/

S4:Electromagnet for locking's anxiliary switch	R0~R1：Resistance	K0：Anti-pumping relay (optional)
S1~S3：Energy staring travel switch	M：Spring charge motor	Y1：Electromagnet for interlocking (optional)
QF：Auxiliary switch	GK-1：Controller	SC：Over current trip coil (optional)
HQ：Closing coil	V1~V4：Rectifier	
TQ：Opening coil		

VB2 Plus G-15 Generator Circuit Breaker

Structure

Overview

The VB2 Plus G circuit breaker uses a vacuum interrupter for the making and breaking of an electric power circuit. The movable primary cluster contacts on the breaker are connected to fixed primary contacts in the switchgear and a secondary disconnectable plug connects with the secondary socket of the switchgear. The operating mechanism is equipped with a compact spring charging mechanism. The mechanism adopts a modular design method and some parts have multiple functions.

Figure 1 Primary circuit

1. Upper arm 2. Embedded poles
3. Lower arm 4. Cluster

Primary circuit

The primary circuit is made up of cluster upper arms, lower arms and embedded poles (figure 1). The vacuum interrupters and main contact parts are embedded in epoxy resin using APG process, which ensure the vacuum interrupters are protected from the ambient influence and mechanical damage.

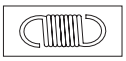
Figure 2 Front panel of the circuit breaker

1. Opening button
2. Status indicator for charging
3. Closing button
4. Counter
5. Indicator for open or close

VB2 Plus G-15 Generator Circuit Breaker

Operating mechanism

The spring operating mechanism consists of a single module. The operating mechanism is equipped with manual charging device which uses the charging handle and an electric charging device which charges the spring via a motor. The mechanism has a reclose function. On the front panel of the circuit breaker, there are Open/Close, Charged/Discharged indicators and the manual operating handle. The operator can operate the breaker locally through manual push buttons or remotely via the closing and opening coils, the status of the circuit breaker can be observed on the front panel (figure 2).

Energy charged status indicator		Closing-opening status indicator		Manual closing & opening buttons	
	The spring is charged		The circuit breaker is closed		Manual closing button
	The spring is discharged		The circuit breaker is opened		Manual opening button

VB2 Plus G-15 Generator Circuit Breaker

Ordering Check List

VB2 plus G-15 Generator Circuit Breaker（MV_CAD_2024V01)

Project _____ Product_____

Order Quantity_____

Rated Voltage: ● 15kV Operating Mechanism: ● Spring Structure: ○ Withdrawable ○ Fixed

Pole Type	● Embedded Pole				
Phase Distance	● 275mm				
Rated Current	○ 2500A	○ 3150A	○ 4000A	○ 5000A	○ others
Breaking Current	○ 31.5kA	○ 40kA	○ 50kA		
Earthing Mode	○ Earthing with copper bar at the bottom of truck			○ Earthing with connecter on the sides of truck	
Open&Close Coil	○ DC110V	○ DC220V	○ AC110V	○ AC220V	
Charging Motor	○ DC110V	○ DC220V	○ AC110V	○ AC220V	
Secondary Wiring	○ Withdrawable Method（64 Pin）			○ Fixed Method	
	○ Withdrawable Method（58 Pin）			○ Other Method	
Other **	Close Interlock	○ DC110V	○ DC220V	○ AC110V	○ AC220V
	Truck Interlock	○ DC110V	○ DC220V	○ AC110V	○ AC220V
	Anti Pump	○ YES			
Over Current Release *	○ Without over current release	○ 1 over current release		○ 2 over current release	○ 3 over current release
Standard Accessory *	○ Energy-stroing handle（2 pcs for each 5 breakers）			○ Rocking handle of chassis（2 pcs for each 5 breakers）	

Special Request:_____

Signature of buyer_____ Date _____/_____/_____

*It will have additional cost if not a standard product(except anti-pump relay)

GEIS

Website： www.geis.tech
Hotline: 400-820-5234

Version No.: MV_CAD_2024V01