Grid Solutions

CABA

Compact Air-insulated Breaker Assembly

Customized Smart Solution

CABA is a modular system design combining a live tank circuit breaker and a double side break disconnect switch, both mounted on a common frame. It can be installed in a green field substations as well as in existing substations (retrofit). One of the key advantages of the CABA concerns the structure, as it can be installed on existing foundations.

Grid Solutions' position as global leader in high voltage equipment as circuit breaker and disconnecting switch, is based on the operating experience accumulated from more than 100,000 circuit breakers with spring operating mechanism that are in service throughout the world.

Circuit Breaker

Three (3) phase either gang or independent pole operated circuit breaker with spring-spring mechanism and one free sanding control cabinet and 300 feet of control cable on one spool. Spring-spring mechanism cabinet(s) will be connecting with control cable(s) to the free standing control cabinet.

Disconnect Switch

Double side break disconnect switch Type S3CD: Three (3) phases gang operated, includes interphase piping and operating drive pipe, single phases fully assembled, adjusted and factory tested, with live parts and arcing horns and insulators mounted on bases. Manual operator by worm gear hand crank Optional motor operator available.

Base Steel Structure

It can either be provided with CABA or by a third party. In case it is provided with CABA, Grid Solutions will design it to fit either a green field substation or retrofit application.

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Key Features

- Complete factory-assembly and control: the structure can easily replace existing equipment ensuring a high quality solution and a drastically reduced delivery time.
- Ideal for replacement or upgrade of circuit switcher installations. CABA provides full circuit breaker function in the same space.
- Reliable operating mechanisms: the circuit breakers are powered by spring-spring operated mechanisms from Grid Solutions Grid's FK3 series.
- Testing: CABA meets the requirements of IEC and IEEE/ANSI standards.

Customer Benefits

- Modular design for green field or retrofit
- Improved substation protection
- CABA will not require new foundation for retrofits on standardised modules
- Easy site installation and commissioning
- Circuit Breaker performance in a Circuit Switcher footprint

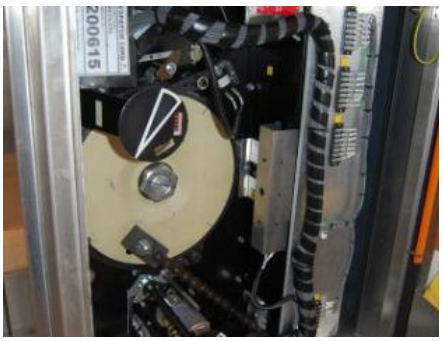
Reliable Operating Mechanism

Advanced technology in circuit breaker and disconnect switch requires reliable mechanism designs.

- CABA circuit breakers are powered by Spring-Spring operated mechanisms from Grid Solutions type FK3 Series. The spring-spring operated mechanisms use the most reliable helical compression springs.
- CABA disconnect switches are operated using a manual or motor mechanisms. Thousands of Grid Solutions high voltage switches are already in service worldwide are equipped with these state of the art mechanisms technologies.

Applications

- Transformer protection
- Line and cable switching
- Capacitor bank and back-to-back switching
- Reactor switching
- Circuit-switcher



FK3-2 Spring-spring mechanism

Disconnect switch manual mechanism

Disconnect switch motor operator

Additional Equipment

Following equipment can be added without changing the footprint.

Optional features like key interlocks and earthing switches are also available.

- Ground switch can be mounted on the disconnect switch side, either in line or perpendicular to the disconnect switch. The ground switch will have its own manual hand crank, which is the same devise as the disconnect switch.
- Conventional free-standing current transformer can be added on the disconnect switch side. The current transformer may be mounted in place of the disconnect switch support insulator, thereby using the CT as support for the fixed switch contact.
- Digital current transformer can be added either on the circuit breaker or disconnect switch side or both sides. Thanks to the lightweight the digital current transformers, they can be mounted directly to the circuit breaker high voltage terminals as well as on the disconnect switch high voltage terminals.

Live Tank Circuit Breaker

Rated voltage	kV	72.5	145	245	245
Circuit-breaker type		GL 309	GL 312	GL 314	GI 314X
Circuit-breaker operating mechanism		FK3-1 Spring	FK3-1 Spring	FK3-6 Spring	FK3-4 Spring
Rated continuous current	A	3,150	3,150	3,150	3,150
Rated frequency	Hz	50/60	50/60	50/60	50/60
Rated dielectric withstand					
• Power frequency 1 minute dry	kV	160	310	460	460
• BIL (1.2/50s impulse wave)	kVpeak	350	650	900	1,050
• 2s chopped wave kVpeak	kVpeak	452	838	1,160	1,160
Rated short-circuit breaking capacity					
• Periodic component	kArms	40	40	40	63
• Percentage DC component	%	53	53	53	68
• First pole to clear		1,5	1,5	1,5	1,5
• Interrupting time cycles		3	3	3	3
• Rated short-circuit making current	kApeak	108	108	108	170
• Rate out-of-phase breaking capacity kA	kA	10	10	10	16
Rated line-charger breaking capacity (C2 class)	A	100	160	400	400
Rated capacitor bank breaking capacity (C2 class)	A	630	400	1,200	1,200
Rated operating sequence			O-0,3s-CO-15s-CO		
Ambient temperature (without blanket heaters)	°C	-40 to +40	-40 to +40	-25 to +40	-30 to +40

**Low temperature performance to -50°C is available with the used of mixed gas (SF_6/CF_4)*

Circuit Breaker Maintenance

- 10,000 operation at no load (mechanical)
- 2,500 operations at rated load
- 15 operations at rated short circuit current

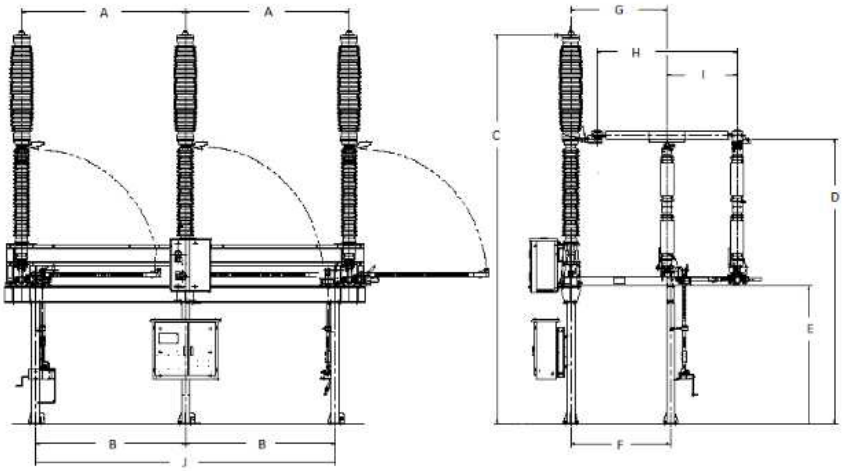
Three Phase Disconnector - Double Side Break

Rated voltage	kV	72.5	145	245	245
Disconnect switch type		S3CD	S3CD	S3CD	S3CD
Disconnect switch operating mechanism		Manual handcrank*	Manual handcrank*	Manual handcrank*	Manual handcrank*
Rated Frequency	Hz	50/60	50/60	50/60	50/60
Rated continuous current	A	3,150	3,150	3,150	3,150
Rated continuous current 30 minutes emergency 4100 4100	A	4,100	4,100	4,100	4,100
Rated dielectric withstand (IEEE/ANSI Standard)					
• Power frequency 1 minute dry	kV	175	335	465	465
• Power frequency 10 second wet	kV	146	275	385	385
• BIL (1.2×50 per second rated withstand)	kApeak	350	650	900	1,050
Rated short time current					
• Three (3) second	kArms	63	63	40	63
• Momentary current	kA	100	100	100	100
• Peak current	kApeak	164	164	164	164
• Capacitance current switching capability	A	1	1	1	1
• Transformer magnetising current switching capability	A	3	3	3	3
Open gap length (IEEE/ANSI standard)	Inches	22×2	38×2	50×2	50×2
Open rotation gap	Degrees	80	80	80	80
Rated ice breaking capability	Inches	0.75	0.75	0.75	0.75
Number					
Ambient temperature	°C	-50 to +50	-50 to +50	-50 to +50	-50 to +50

** Motor mechanism on request*

Disconnect Switch Maintenance:

- 1,000 operation at no load (mechanical)



Dimensions

Product Name	Rated Voltage kV	A (In) (mm)	B (in) (mm)	C (in) (mm)	D (in) (mm)	E (in) (mm)	F (in) (mm)	G (in) (mm)	H (in) (mm)	I (in) (mm)	J (in) (mm)	Steel Support Legs
CABA 69	72,5	69 1,753	N/A	177,8 4,517	137,9 3,502	82,3 2,091	N/A	53,9 1,370	61,4 1,560	30,7 780	96 2,438	2
CABA 145	145	98,4 2,500	N/A	240,6 6,111	184,9 4,696	102,4 2,600	N/A	72,9 1,850	93,8 2,380	46,9 1,190	96 2,438	2
CABA 170	170	118,1 3,000	N/A	234,7 5,961	162,2 4,129	74,5 1,892	102 2,591	131,3 3,336	106,4 2,702	53,2 1,351	132 3,353	4
CABA 245	245	137,8 3,500	126 3,200	307,8 7,815	224,7 5,707	108,9 2,766	84 2,134	81,1 2,059	118,1 3,000	59,05 1,500	275,6 6,400	6

** E - this distance is variable according to substation design*

All the CABAs above are available with Independent Pole Operators IIPO)

For more information, visit
gevernova.com/grid-solutions

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English
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