



# High Voltage Disconnect Switches

Flexible design configurations from 72.5 - 800kV



with Primary Plus™

Pre-engineered solution set that digitizes XD|GE primary equipment and provides factory installed and configured protection, monitoring, diagnostics and communications.



GE  
Digital Energy



GW11-363kV Disconnect Switch



GW4-145kV Disconnect Switch

## Technology Solutions for Global Utilities

For over a century, utilities have relied on GE to deliver electrical products and services to meet their reliability and operational performance needs. GE is a leading provider of transmission and distribution solutions as well as grid automation systems that maximize utilities operational efficiencies and provides their customers with reliable power.

With decades of experience, GE has brought reliable transmission and distribution products to utilities around the globe. GE has manufactured and partnered to install equipment in nearly 40 countries on five continents, we know what it takes to meet our customer's power needs around the world.

Through an alliance with XD Electric, GE has extended its portfolio to include all high and ultra-high voltage power equipment. XD Electric is one of China's largest primary equipment manufacturers dedicated to the research, application and development of high and ultra-high voltage power equipment. XD Electric is a premier high voltage breaker manufacturer in China with world-class design capability.

The XD|GE alliance brings end-to-end transmission and distribution solutions to meet the global growing demand for electricity. The combined portfolios of GE and XD will provide one of the most comprehensive sets of technology solutions for customers in the utility sector and energy intensive industries.

The XD|GE disconnect switch facilities are ISO certified and have industry leading positions in quality, innovation, and field reliability with more than 58 years of experience. The disconnect switch is manufactured in the same facility and follows the same strict design and manufacturing standards as the GIS and circuit breakers products.



## Key Features

- Flexible design configurations from 126 – 800kV including both horizontal and vertical configurations; center, side, double side, and V break designs
- Designed for minimum but reliable clearance between phases & vertical length
- Conductive parts are constructed of light-weight, strong aluminum alloy
- Driving parts and balance spring are enclosed to minimize environment exposure
- Hot dip galvanized process on all exposed iron and steel parts provide excellent anti-corrosion capability
- Height of porcelain and perpendicularity may be adjusted via regulating bolts to ease installation
- Earthing switches are available at both ends of the frame
- Insulators are available in both ANSI 70 gray and IEC brown

## Primary Plus



XD|GE offers Primary Plus on all its primary equipment. Primary Plus is a pre-engineered solution set that provides utilities with a means to reduce the time and labor associated with substation construction and expansion, while at the same time utilizing technologies and methodologies familiar to existing resources.

XD|GE's factory installed and configured solutions include:

- Digitized primary equipment by replacing labor-intensive, individually terminated copper wires with standardized physical interfaces and open digital communications
- Electrical protection systems optimized for the equipment and application to monitor and react to fault conditions
- Highly secure and ruggedized communication network equipment including industrial strength wireless, fiber optic multiplexers and Ethernet switches



GW10/11-550kV Disconnect Switch

# Overview

## Introduction

XD|GE has more than 50 years of experience in disconnect switch research, development, and production. Advanced 3D design tools for simulation, assembly, and motion graphics help to improve the design quality and shorten the design and manufacturing cycles. The disconnectors are manufactured in a new 2,600 square meter workshop with an annual capacity exceeding 2,000 sets per year.

## Key Functions

- Isolating - Provide a visible isolating point to ensure crew safety while performing maintenance
- Switching- shifting equipment from one operation mode to another including operation, backup, maintenance
- Circuit Operation - can operate within the circuit with no or little current
- While open, disconnect switches show a visible opening point which meet insulating clearance requirements
- While closed, disconnect switches carry working current as well as short circuit current within a specified time

## Typical Environmental Conditions

- Altitude: <2000m above the sea level
- Ambient temperature: -50 to +55 °C
- Maximum wind speed: 40m/s
- Earthquake accelerate: horizontal 0.3g, vertical 0.15g (or per customer request)
- Ice coating thickness: 20mm
- Maximum intensity of sunlight: 1000W/m<sup>2</sup>
- Pollution: class III (heavy pollution), class IV (special conditions)
- Relative humidity: daily average is not more than 95% ; month average is not more than 90%

## Standards and Certifications

XD|GE began designing and producing disconnects switches in the early 1950s. Our disconnect switches are designed to meet rigorous international standards including:

- GB1985-2004
- DL/T 486-2000
- DL/T 593-2006
- GB/T 11022-2011
- IEC 60694
- IEC 62271 - 1
- IEC 62271 - 102
- ANSI 37.16, 30, 32



GW4-145kV Disconnect Switch


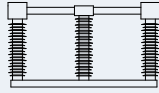

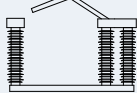



GW7-363kV Disconnect Switch



GW11-420kV Disconnect Switch

## Product Portfolio

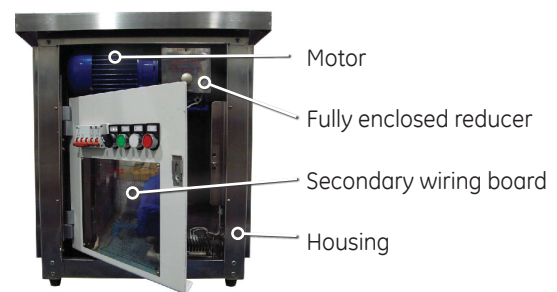
Type	GW4	GW7	GW10	GW11	GW6
					
Rated Voltage	72.5 - 252kV	252 - 800kV	126 - 550kV	126 - 800kV	126 - 550kV
Rated Current	Up to 4000A	Up to 6000A	Up to 5000A	Up to 5000A	Up to 4000A
Short Circuit withstand current/3s	Up to 50kA	Up to 63kA	Up to 63kA	Up to 63kA	Up to 63kA
Rated Peak Withstand Current	Up to 125kA	Up to 160kA	Up to 160kA	Up to 160kA	Up to 160kA
Type of Motor Operation Mechanism	CJ6B	CJ6A/CJ6U	CJ6A	CJ6A/CJ6U	CJ6A

### CJ6 Series Motor Operating Mechanism

The CJ6 series motor operation mechanism is easy to adjust, small in size, light weight, and compact. The housing is constructed from stainless steel riveted without welding resulting in an end product which is corrosion-proof as well as water and dust-proof.

- Interlock units are able to meet multi-interlock functions at the same time.
- The mechanisms are universal and meet the operating requirements of all disconnectors and earthing switches made by XD|GE.
- 2-step worm gear allows manual operation to be done reliably, smoothly, and with low noise.

#### Motor Operating Mechanism



### Main Technical Data

No.	Item		CJ6B	CJ6A	CJ6U
1	Electromotor	Rated Voltage	380V (AC)	380V (AC)	380V (AC)
		Rated Speed	1400rpm	1400rpm	960rpm
		Rated Power	370W	550W, 750W	750W
2	Heater	Rated Voltage	220V (AC)	220V (AC)	220V (AC)
		Input Power	80W	100W	100W
3	Control Loop	Rated Voltage	220V (AC)	220V (AC)	220V (AC)
			220V (DC)	220V (DC)	220V (DC)
			110V (DC)	110V (DC)	110V (DC)
4	Auxiliary Switch	Rated Voltage	220V (DC)	220V (DC)	220V (DC)
		Rated Current	220V (AC)	220V (AC)	220V (AC)
			2.5A (DC)	2.5A (DC)	2.5A (DC)
			5A (AC)	5A (AC)	5A (AC)
5	Operating Mechanism	Contacts Number	10 Normally Open 10 Normally Closed	10 Normally Open 10 Normally Closed	10 Normally Open 10 Normally Closed
		Torsion angle	1800 (900)	1800 (900)	1800
		Rated Torque	200~700Nm	300~1200Nm	2300Nm
		Close Time	4S, 8S	4S, 6S, 8S, 9S, 10S, 12S, 16S, 20S	18S ± 2S, 24S ± 2S, 32S ± 2S, 40S ± 2S
		Opening Time			
6	IP		IP65	IP65	IP65
7	Weight		55Kg	75Kg	120Kg

# GW4 Disconnect Switches

## Center Break Disconnect Switch

GW4 series disconnect switches are structured in double columns for single pole, one break, and horizontal rotary opening. There are two columns in each phase. Supporting insulators at both ends are rotated horizontally by the operating mechanism in performing the open and close operations. The main conductive blade is mounted on the top of the supporting insulator. A mechanical interlock is mounted between the earthing switch and the main blade to ensure a correct operating sequence of the disconnect switch and earthing switch.

## Key Benefits

- A simple structure with fewer moving parts and lower operation torque provide reliable, steady operation throughout the product lifecycle.
- Capable of handling higher induced current and voltage and meet the requirements of IEC62271-102 standard type B.
- Convenient for installation and replacement due to independent installation of conductive rod and moving contact.

## Key Features

### Flexible contacting outgoing base

The soft connection is applied between the terminal and conductive rod, resulting in a design that is simple in structure with minimum contact resistance and high conductive reliability.

### Strong current flow in conductive rod contact finger

The conductive rod contact finger is constructed using aluminum alloy, resulting in a strong, light-weight design and a wide heat radiance area. The stainless spring is located at the outside of the contacting plate to avoid shunt through the spring. The contacting plate and the flexible joint are molecule-welded under high pressure as a whole, with only one contacting point in the current passage to ensure strong current-carry ability.

The conductive rod contact head is made of aluminum alloy square pipe, the design is strong and light-weight with a wide heat radiance area.

The contact results from bending the copper plate installed to the conductive rod. This enlarges the electrical conduction area and results in ease of the maintenance and component replacement. There is limited friction between the plate contact and contact position in the switching operation.

### Accurate transmission and ease of commission

The transmitting component is constructed using a stainless steel composite shaft which is anti-corrosive with minor resistance force, and small fit clearance.

The rotating parts and lever are positioned below the insulating porcelain and comprise the installing structure and ensure accurate transmission. The porcelain bottle can be raised through the lifter making commission and adjustment easy to perform.



Conductive Rod Contact Finger



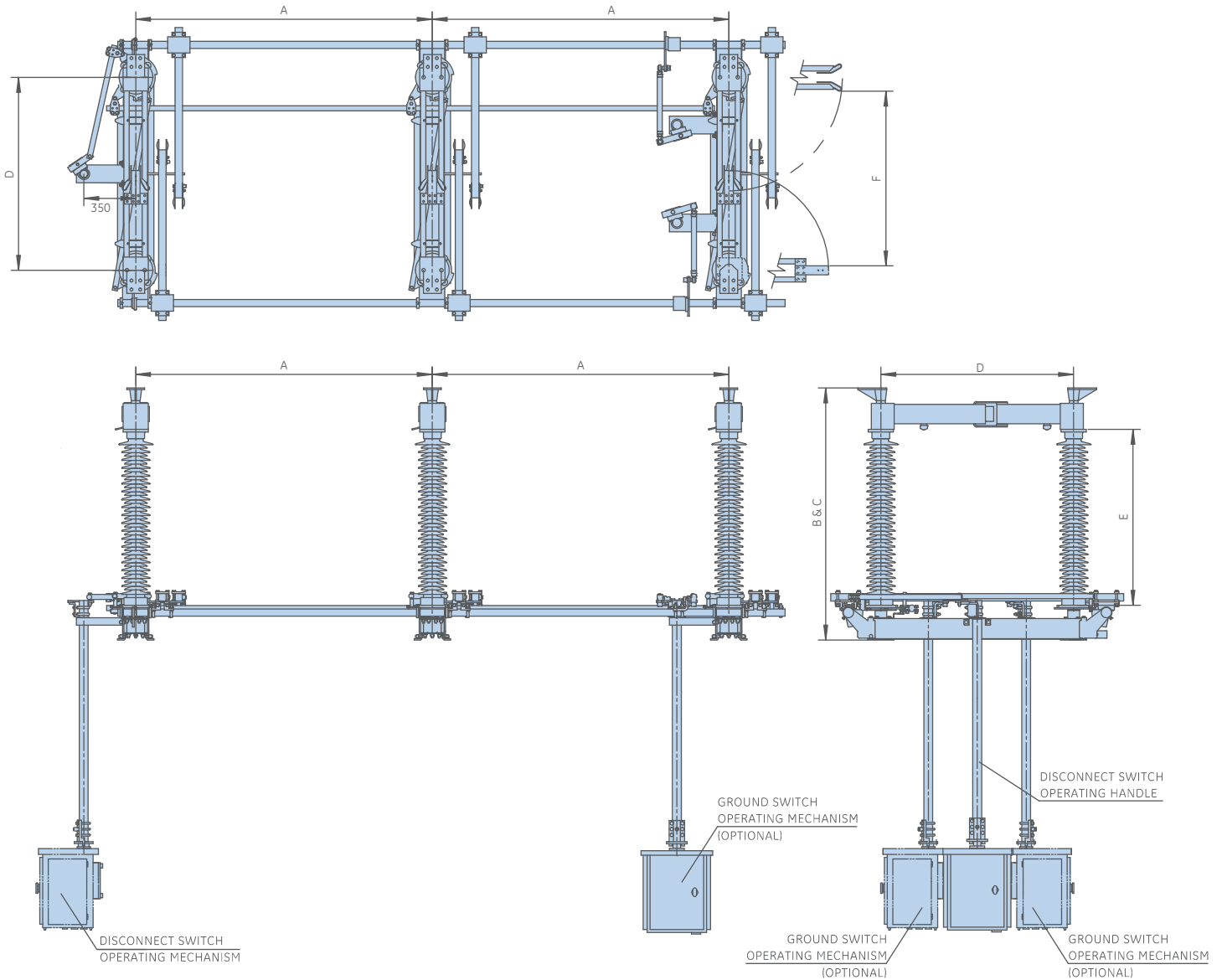
GW4 Double Column Center Break Disconnect Switch



GW4 Double Column Center Break Disconnect Switch

# GW4 Installation Dimensions

GW4



GW4 Dimensional Table

Model #	A Nominal Ph-Ph Spacing (mm)	B Height of Term Pad over Base (mm)	C Maximum Height of Disconnecter over Base (mm)	D Support Insulator Distance (mm)	E Insulator Height (BIL Related) (mm)	F (Minimum Isolating Distance) Min. Metal to Metal w/ Switch Open (mm)
GW4-72.5DW/2000	1600	1258	1258	880	850	710
GW4-72.5DW/4000	1600	1426	1426	1000	850	830
GW4-126/1250	2000	1640	1640	1300	1200	1630
GW4-126/2000	2000	1684	1684	1300	1200	1630
GW4-126/3150	2000	1780	1780	1300	1200	1590
GW4-252	4000	2838	2838	2650	2300	2250

# GW7 Disconnect Switches

## Double End Break Disconnect Switch

GW7 series disconnect switches are structured in three columns for single pole, double breaks, and horizontal rotary openings. There are three columns in each phase. Supporting insulators at both ends are fixed while the middle one can be rotated horizontally by the operating mechanism in performing the open and close operations. The main conductive blade is mounted on the top of the middle supporting insulator, and the stationary contacts are on the top of the other two fixed contacts. A mechanical interlock is mounted between the earthing switch and the main blade to ensure a correct operating sequence of the disconnect and earthing switch.

## Key Benefits

- A simple structure with fewer moving parts and lower operation torque provide reliable, steady operation throughout the product lifecycle.
- Capable of handling higher induced current and voltage and meets the requirements of IEC 62271-102 standard type B.
- Rotary conductive blade design provides short operational torque, high contacting pressure, self-clean contact, and strong ice-breaking capability.
- Ease of installation and replacement due to independent installation of conductive rod and moving contact.

## Key Features

### Stationary Cast Aluminum Contact Base

The cast aluminum stationary contact base is integrated with the wiring terminator with no welding joint on the conductive route. The arc strike device is used to switch the bus bar transferring current to limit the small electric inductance and micro-capacitor current. The fold-bend type contact strengthens the current in conductive circuit and increase the clamp force.

### Copper and Silver Moving Contact

The copper and silver moving contact uses welding technology to provide a high level of mechanical strength and heat-conducting property as well as prevent electronic corrosion. The conductive rod is constructed of high-strength, anti-corrosion steel pipe which has powerful current-carry capability, a wide heat radiance area, and better anti-corrosion performance.

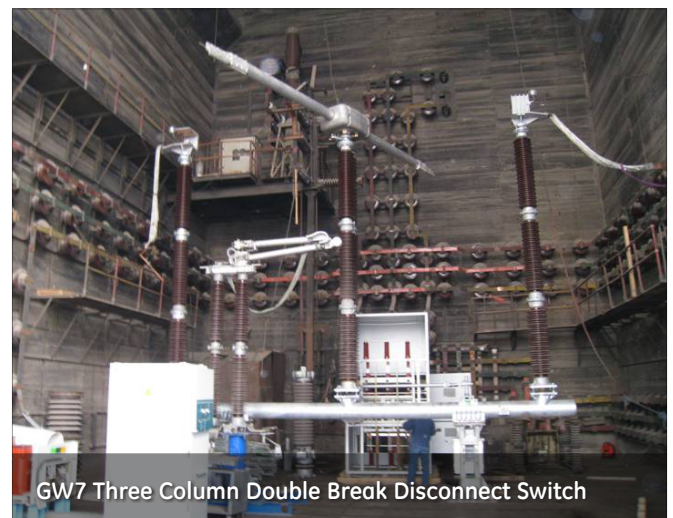
### Robust, Seamless Steel Pipe Base

The base is made of large-caliber seamless steel pipe which can meet the strength requirements for supporting the product as well as reducing the overall product weight.

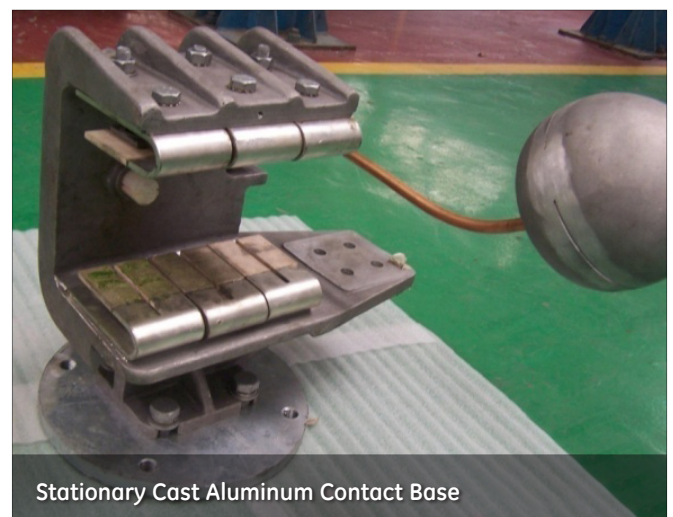
The base is a robust structure and its civil foundation can easily meet most assembling criteria. The robust base can minimize the construction workload and can prevent the switching faults caused by the foundation settlement commonly seen with a segmented structure base.



GW7 Three Column Double Break Disconnect Switch



GW7 Three Column Double Break Disconnect Switch

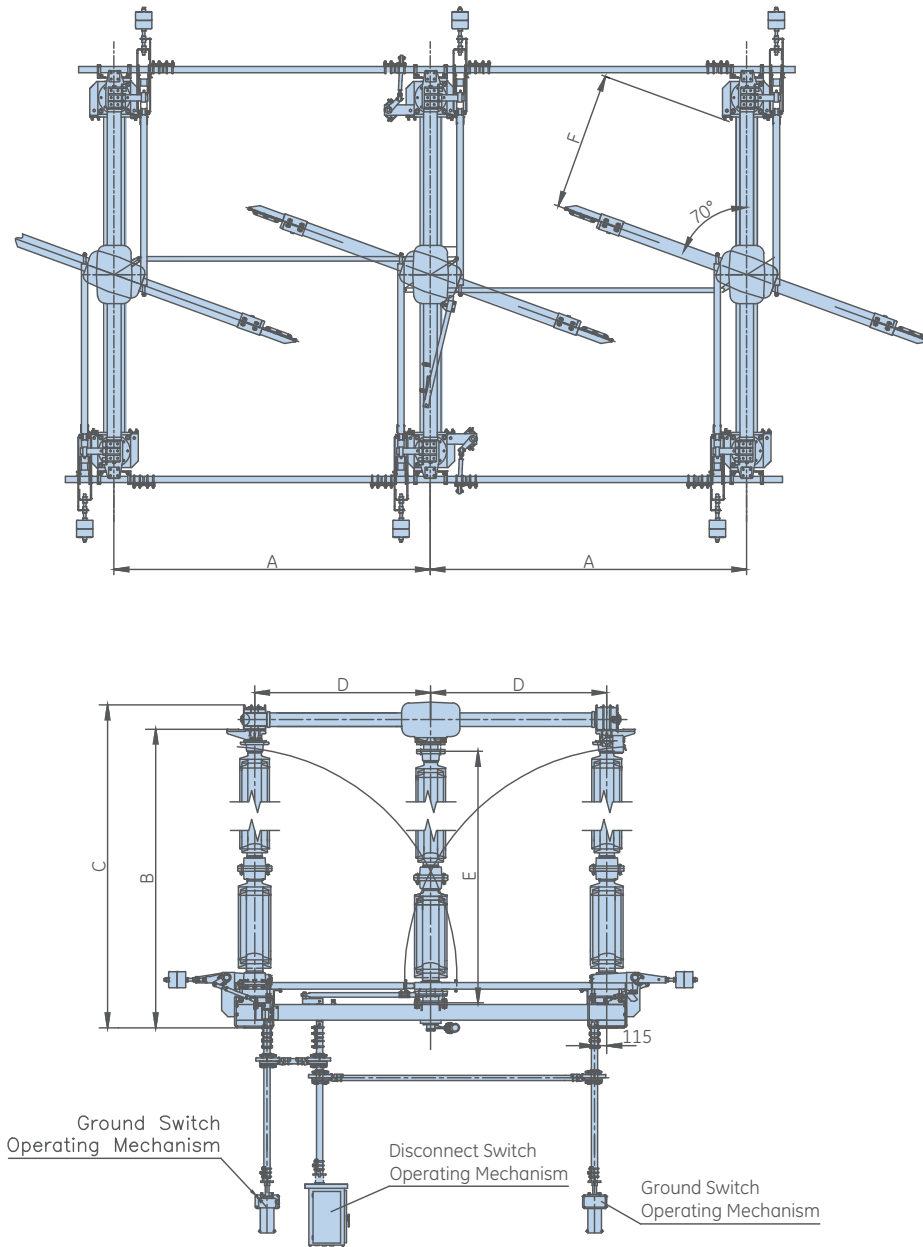


Stationary Cast Aluminum Contact Base



# GW7 Installation Dimensions

GW7



GW7 Dimensional Table

Model #	A Nominal Ph-Ph Spacing (mm)	B Height of Term Pad over Base (mm)	C Maximum Height of Disconnecter over Base (mm)	D Support Insulator Distance (mm)	E Insulator Height (BIL Related) (mm)	F (Minimum Isolating Distance) Min. Metal to Metal w/ Switch Open (mm)
GW7B-252	3000/3500	2850	3080	1670	2300	1300
GW7B-363DW	5000	3970	4240	2250	3400	1800
GW7B-420DW	User Define	4770	5040	2600	4000	2100
GW7B-500	User Define	5048	5811	3200	4400	2370

# GW10 Disconnect Switches

## Vertical Pantograph Disconnect Switch

The main blade of the GW10 series disconnect switch is a pantograph blade with an insulated single break in the vertical direction at the open position with minimum clearance between phases and vertical length.

### Key Benefits

- Grading ring is added at stationary contact to improve electric field distribution and to effectively avoid corona.
- Auxiliary contacts are added at both stationary contact and moving contact in order to avoid potential damages caused by electric arc during open and close operation.
- Conductive parts are made of high-strength aluminum alloy with performances of light weight, large current endurance, large surface of radiation, high corrosion resistance.
- Soft connection is used for conductive parts with simple structure and convenient for installation.
- Balance spring is in parallel to reduce required operation force. Stationary contact is almost in steady while operation.
- Supporting frame is hot-dip galvanized with high mechanical strength.

### Key Features

#### Copper and silver moving contact

The copper and silver moving contact uses welding technology to provide a high level of mechanical strength and heat-conducting property as well as prevent electronic corrosion. The conductive rod is constructed of high-strength, anti-corrosion steel pipe which has powerful current-carry capability, a wide heat radiance area, and better anti-corrosion performance.

#### Insulator bearings

Heavy duty, double row ball bearings are used for GW10/11 type switches. They are exceptionally rigid and rotate with very little resistance. Factory lubricated and sealed stainless steel. They are completely maintenance free.

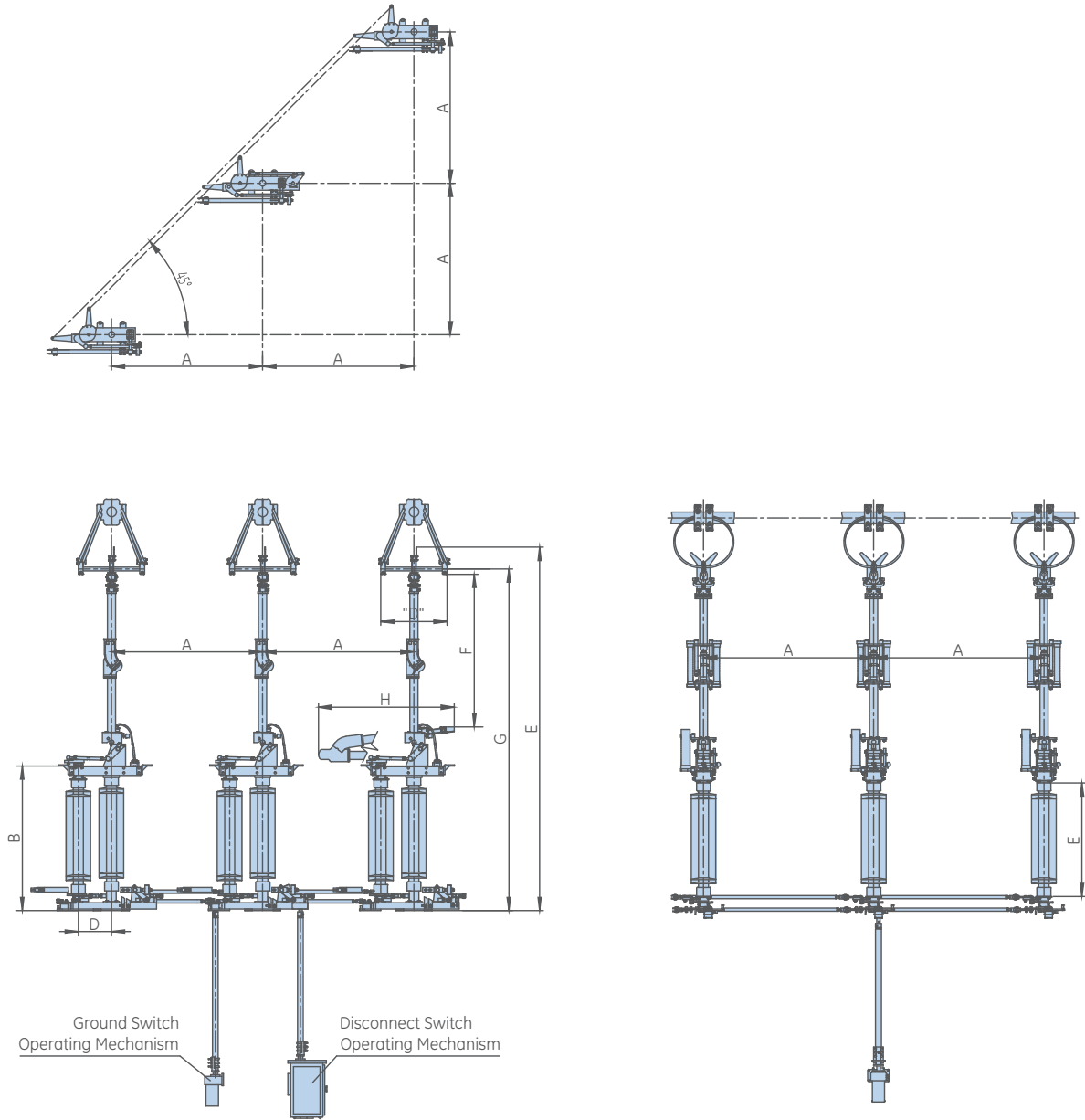
#### Adjustable open and close position stops

Position stops are provided for individual pole adjustments allowing maximum synchronization of the three phase assembly.



# GW10 Installation Dimensions

GW10



GW10 Dimensional Table

Model #	A Nominal Ph-Ph Spacing (mm)	B Height of Term Pad over Base (mm)	C Maximum Height of Disconnecter over Base (mm)	D Support Insulator Distance (mm)	E Insulator Height (BIL Related) (mm)	F (Minimum Isolating Distance) Min. Metal to Metal w/ Switch Open (mm)	G Distance to Suspended Contact (mm)	H Width of Disconnecter (Open)
GW10A-126DW	User Define	1527	3700	350	1200	2153	3562	1440
GW10A-252DW	3000	2688	6215	425	2300	2550	5955	2465
GW10A-363DW	User Define	3715	8317	550	3400	3540	7960	3180
GW10A-420DW	User Define	4315	9477	550	4000	4100	9120	3460
GW10A-550DW	User Define	4715	10877	550	4400	5100	10520	3960

# GW11 Disconnect Switches

## Horizontal Pantograph Disconnect Switch

The main blade of the GW11 series disconnect switch is a pantograph blade with an insulated single break in the horizontal direction at the open position with minimum clearance between phases and vertical length.

## Key Benefits

- Grading ring is added at stationary contact to improve electric field distribution and to effectively avoid corona.
- Auxiliary contacts are added at both stationary contact and moving contact in order to avoid potential damages caused by electric arc during open and close operation.
- Conductive parts are made of high-strength aluminum alloy with performances of light weight, large current endurance, large surface of radiation, high corrosion resistance.
- Soft connection is used for conductive parts with simple structure and convenient for installation.
- Balance spring is in parallel to reduce required operation force. Stationary contact is almost in steady while operation.
- Supporting frame is hot-dip galvanized with high mechanical strength.

## Key Features

### Copper and silver moving contact

The copper and silver moving contact uses welding technology to provide a high level of mechanical strength and heat-conducting property as well as prevent electronic corrosion. The conductive rod is constructed of high-strength, anti-corrosion steel pipe which has powerful current-carry capability, a wide heat radiance area, and better anti-corrosion performance.

### Insulator bearings

Heavy duty, double row ball bearings are used for GW10/11 type switches. They are exceptionally rigid and rotate with very little resistance. Factory lubricated and sealed stainless steel. They are completely maintenance free.

### Adjustable open and close position stops

Position stops are provided for individual pole adjustments allowing maximum synchronization of the three phase assembly.



GW11 Disconnect Switches



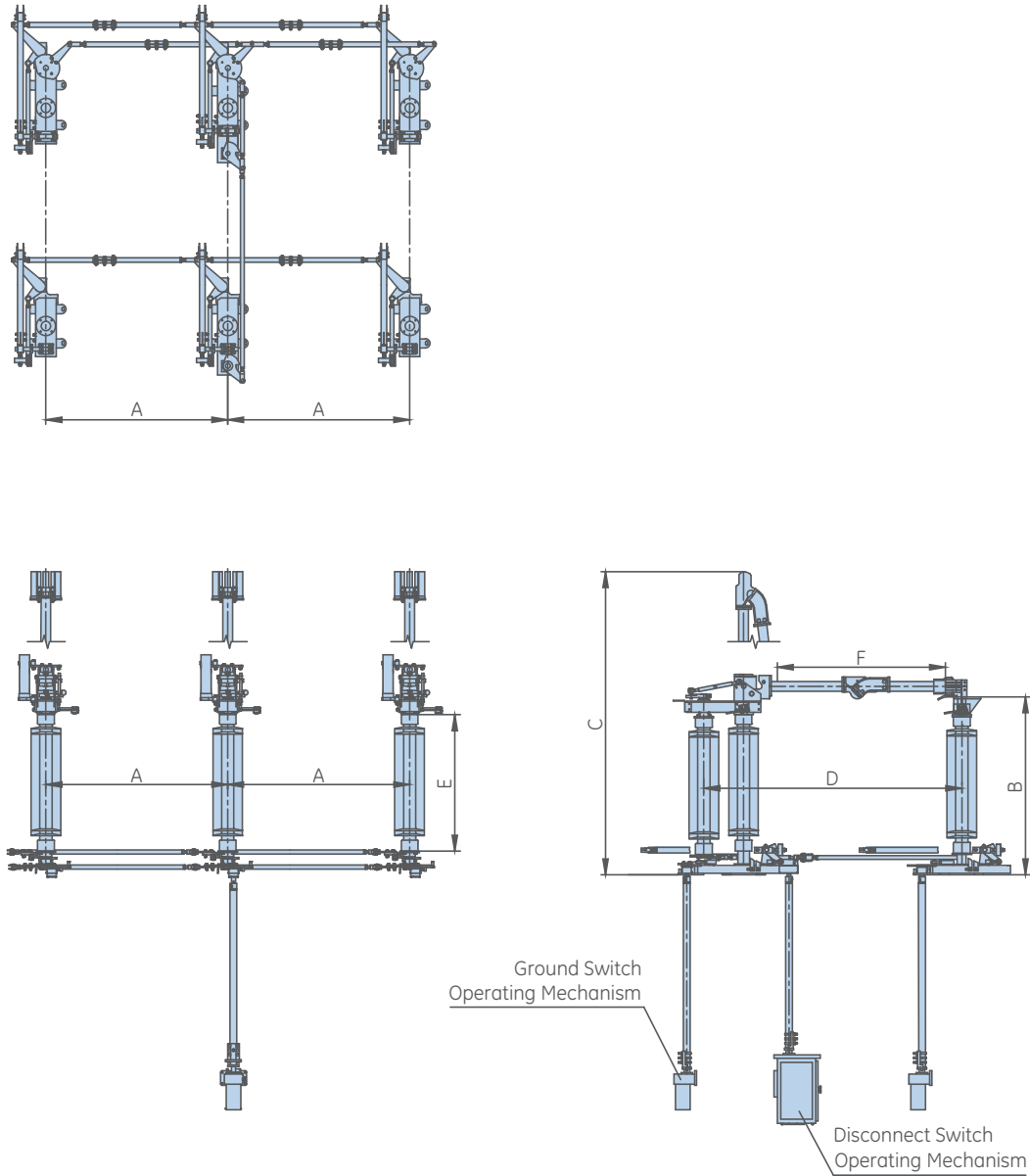
GW11 Disconnect Switches



GW11 Disconnect Switches

# GW11 Installation Dimensions

GW11



GW11 Dimensional Table

Model #	A Nominal Ph-Ph Spacing (mm)	B Height of Term Pad over Base (mm)	C Maximum Height of Disconnecter over Base (mm)	D Support Insulator Distance (mm)	E Insulator Height (BIL Related) (mm)	F (Minimum Isolating Distance) Min. Metal to Metal w/ Switch Open (mm)
GW11A-126IIDW	User Define	1527	2712	1920	1200	1470
GW11A-252IIDW	User Define	2688	4632	3125	2300	2550
GW11A-252DW	User Define	2688	4632	3125	2300	2550
GW11A-363DW	User Define	3787.5	6392	4200	3400	3416
GW11A-420W	User Define	4387.5	7320	4760	4000	3976
GW11A-420IIDW	User Define	4387.5	7320	4760	4000	3976
GW11A-550IIDW	User Define	4787.5	8192	5760	4400	4976

# GW6 Disconnect Switches

## Double Arm Vertical Pantograph Disconnect Switch

The main blade of the GW6 series disconnect switch is a pantograph blade with an insulated single break in the vertical direction at the open position with minimum clearance between phases and vertical length.

### Key Benefits

- Minimized clearance between phases and vertical length allowing placement directly under the busbar.
- Conductive parts are made of high-strength, light-weight aluminum alloy with high mechanical strength.
- Driving parts are made from composite shall sleeve of three-layer material resulting in self-lubrication function, reduced friction, high reliability mechanical drive, and less operating force.
- Operating rod and rotating shaft are made of high-quality stainless steel or high-strength copper alloy.
- Driving parts and balance spring are enclosed in conductor pipes to minimize environmental impact.

### Key Features

#### Copper and silver moving contact

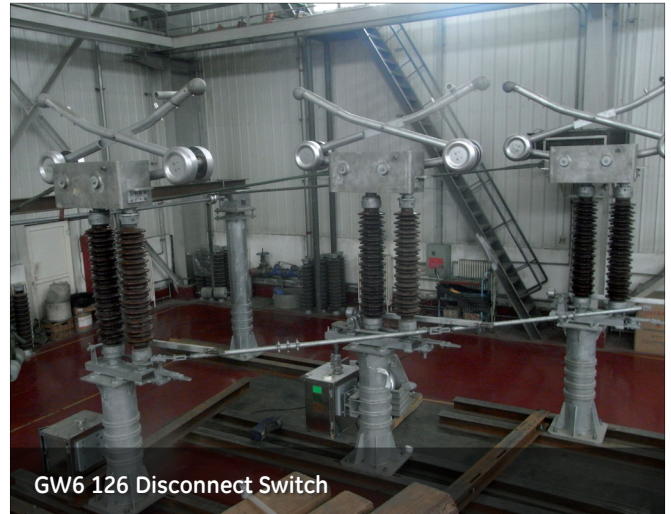
The copper and silver moving contact uses welding technology to provide a high level of mechanical strength and heat-conducting property as well as prevent electronic corrosion. The conductive rod is constructed of high-strength, anti-corrosion steel pipe which has powerful current-carry capability, a wide heat radiance area, and better anti-corrosion performance.

#### Insulator bearings

Heavy duty, double row ball bearings are used for GW6 type switches. They are exceptionally rigid and rotate with very little resistance. Factory lubricated and sealed stainless steel. They are completely maintenance free.

#### Adjustable open and close position stops

Position stops are provided for individual pole adjustments allowing maximum synchronization of the three phase assembly.



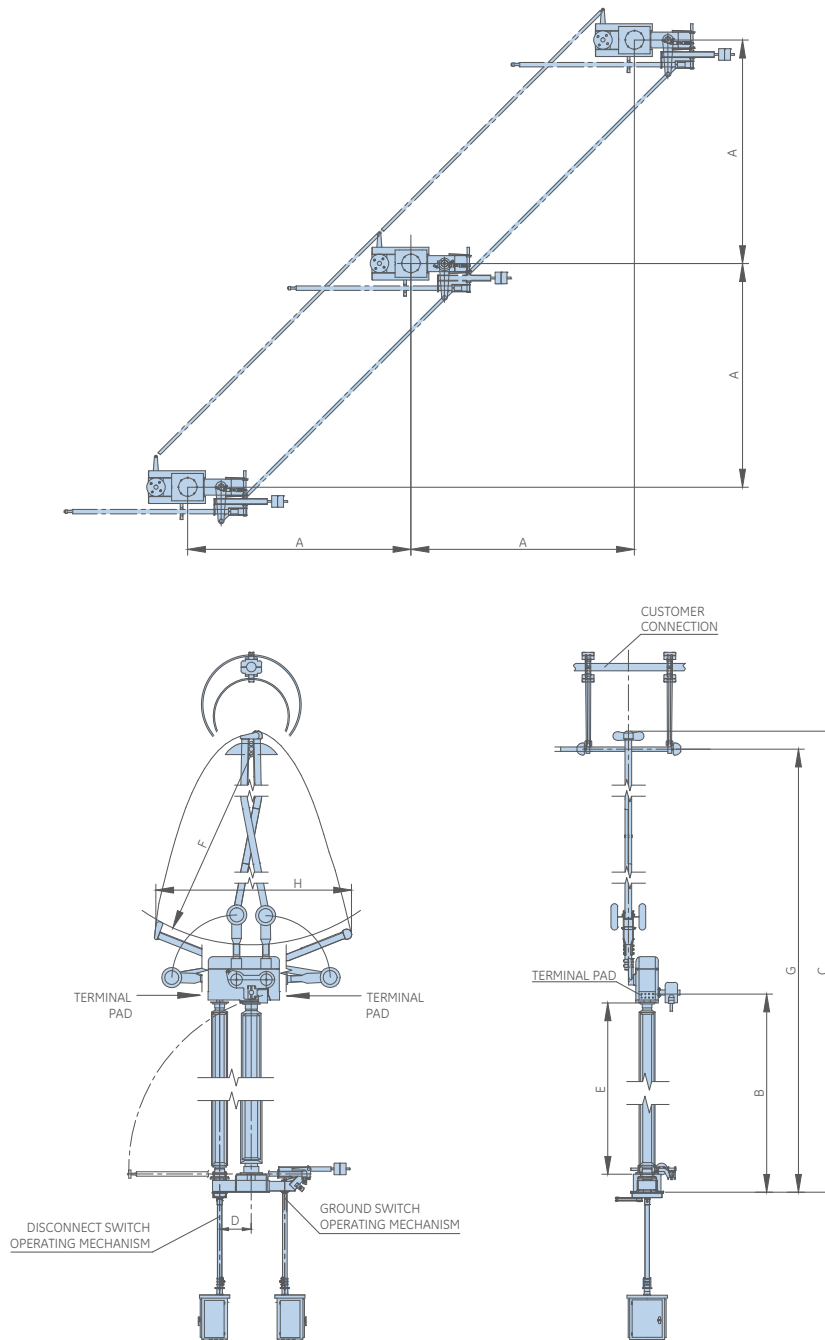
GW6 126 Disconnect Switch



GW6 550 Disconnect Switch

# GW6 Installation Dimensions

GW6



GW6 Dimensional Table

Model #	A Nominal Ph-Ph Spacing (mm)	B Height of Term Pad over Base (mm)	C Maximum Height of Disconnecter over Base (mm)	D Support Insulator Distance (mm)	E Insulator Height (BIL Related) (mm)	F (Minimum Isolating Distance) Min. Metal to Metal w/ Switch Open (mm)	G Distance to Suspended Contact (mm)	H Width of Disconnecter (Open)
GW6D-126DW	1600	1585	4200	350	1200	1675	3842	2012
GW6D-252DW	3000	2660	6190	425	2300	2550	5945	2630
GW6D-550DW	User Define	4740	10965	425	4400	4550	10427	4960

# State-of-Art Facilities and Rigorous Quality Processes

## Manufacturing Excellence

XD|GE utilizes a 2,600 square meter workshop with a production capacity of 2,000 units per year to produce high quality disconnect switches across a variety of voltage levels.

XD|GE has developed an advanced 3D CAE system to design, simulate and analyze products. This system has improved manufacturing excellence through a shortened design cycle and reduced defects. According to the characteristics and usage of complex castings, engineers repeatedly study and refine the optimum manufacturing process. In order to ensure the high quality mechanical processing requirements of core components, the manufacturing process includes machining center, whole-function horizontal lathe, CNC drilling as well as high efficiency and precision CNC processing equipment.

## Exceptional Quality

A focus on quality is an ongoing strategic initiative for XD|GE and that is evidenced throughout the manufacturing environment. The quality process begins with an incoming inspection of all materials to ensure the best possible inputs before manufacturing begins.

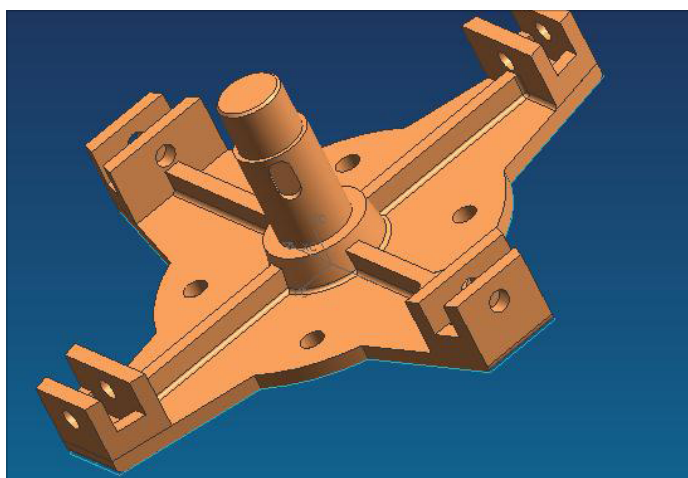
Throughout the production and assembly process, there are multiple checkpoints in the documented test plan, including both visual and “stop flow” inspections. The production facilities follow strict non-conforming procedures to identify, control and avoid the use and delivery of non-conforming products. Each production facility has developed strict environmental standards, including controls of cleanliness, temperature and humidity, and has controls in place to monitor and manage to the established standards.

In addition, XD|GE has a dedicated measuring and inspection department with certified, full-time inspectors in each of its manufacturing sites. The measuring and inspection department provides a secondary cross-inspection for all work in process, as well as finished products, ensuring quality is achieved throughout the manufacturing process. Quality data is maintained and analyzed, per product family, in order to drive continual product and process improvements and higher product reliability.

From raw materials acquisition and inspection to finished product, XD|GE’s disconnect switches are designed to meet rigid quality processes that ensure the installed product provides the highest level of reliability.

## Advanced Test Facilities

XIHARI® is the Xi'an High Voltage Apparatus Research Institute and is an integral part of the XD|GE alliance. XIHARI has extensive testing capabilities at its facility sites, which include: High Power Laboratory, High Voltage Laboratory, Artificial Climate Laboratory, and EMC Laboratory and an Operational Test Circuit for HVDC Thyristor Valves. The testing facility for XD|GE equipment is the largest testing hall in Asia, measuring over 40,000 square feet and having a ceiling height of nearly 160 feet.





# Support and Service

## Global Project

### Engineering Services

GE is dedicated to the success of its customers and provides an array of comprehensive services to help successfully deploy and maintain GE products and business solutions globally. World-class post-sales support, professional services, and supportive resources are ready to ensure that you effectively use the technical power and business advantages that come with GE products.

This support infrastructure covers the entire life cycle of the product. You can count on our GE global services team from the coordination of transportation logistics through the completion of site acceptance testing and into warranty and support phases of the product life cycle.

Access to our GE support team for post commissioning needs is simplified to a single phone number or email address. Our global support center will be staffed 24x7 to field any incoming concerns and ensure our customer needs are fulfilled as quickly as possible.

Our experienced and qualified GE field service team has significant reach and leverage across the globe. The field service team will also have access to significant high-voltage power equipment domain expertise.

Our dedicated global service team comprises of qualified service engineers, in addition to a global field service network to deliver world-class installation, commissioning and post-sales support.

### Specialized Installation & Commissioning

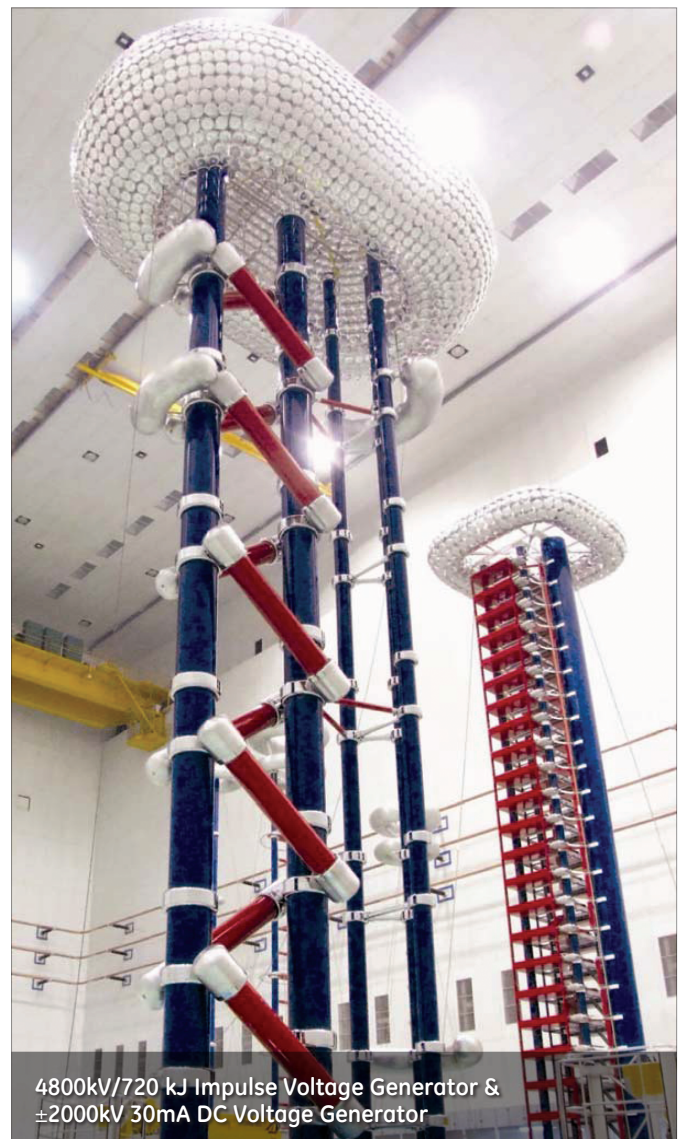
- Logistics including coordination of ocean and inland transportation
- Complete installation services include rigging, labor (mechanical and electrical)
- Receiving, rigging, and unloading
- Testing system commissioning
- Site acceptance testing

### Post-Sales / Installation Support

- 24x7 Global customer service with operators available to respond to customer requests
- Emergency response hotline
- Several customer support access points available to obtain support (telephone, e-mail, fax, or web)
- Warranty backed by the strength of GE
- We offer a global system of maintenance and repair facilities



Disconnect Switch Workshop



4800kV/720 kJ Impulse Voltage Generator &  $\pm 2000$ kV 30mA DC Voltage Generator

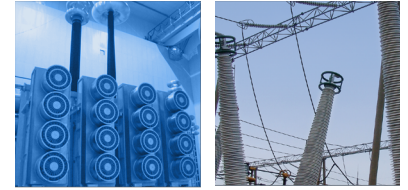
# Primary Plus



## Pre-Engineered Secondary Equipment

Primary Plus, XD|GE's supplemental offering to its primary equipment, is a pre-engineered, factory installed solution set that allows utilities to reduce the time and labor associated with substation construction and commissioning. Primary Plus uses technologies and methodologies familiar to existing resources and skill sets.

- Digitized primary equipment for replacing labor-intensive, individually terminated copper wires
- Electrical protection solutions to monitor and react to fault conditions
- Secure and ruggedized communications infrastructure devices including wireless radios, fiber optic multiplexers and Ethernet switches



## Digitized Substation

### Multilin™ HardFiber System

- Using the Multilin HardFiber system, XD|GE can deliver primary equipment with digital communications. The Multilin HardFiber system digitizes analog signals from primary assets utilizing IEC 61850 communications, reducing total life costs of protection and control through labor and resource optimization.
- This factory-installed solution reduces the amount of labor-intensive, individually terminated copper wire connections with pre-terminated copper and fiber optic cables with standard physical interfaces and open digital communications.

### Key Benefits

- Saves up to 50% of Protection & Control labor costs
- Eliminates the majority of copper wiring to better utilize resources for the design, building, commissioning, and maintenance of power system protection and control
- Robust and simple architecture for deploying IEC 61850 process bus
- Improves employee safety by leaving potentially dangerous high-energy signals in the switchyard
- Reduces the chances for operational mistakes made during isolation and restoration after routine maintenance
- Built as an extension of the Multilin Universal Relay (UR) family of products, suitable for a wide array of protection applications
- Rugged, hardened, and secure switchyard interface enabling NERC/CIP compliance



## Electrical Protection & Control

### Advanced Relays for Primary Substation Equipment

Primary Plus utilizes the Multilin C60 Breaker Protection system or Multilin F60 Feeder Protection system to provide primary protection of critical substation equipment. Multilin relays are substation hardened devices that provide comprehensive protection, control, automation, and monitoring of high voltage substation circuit breakers. With fast, deterministic execution of programmable automation logic, extensive I/O options, and integrated high-speed peer-to-peer communications, Multilin protection devices can receive and execute commands and at a fraction of the cost when compared to a traditional hard-wired configuration.

### Key Benefits

- Advanced circuit breaker monitoring and control in a single platform
- Complete IEC 61850 Process Bus solution providing resource optimization and minimizing total protection & control lifecycle costs
- Modular hardware architecture allow for device configuration flexibility, meeting the needs of most circuit breaker applications
- Advanced fault and disturbance recording, including internal device health monitoring, eliminating the need for external devices and maximizing asset life
- Robust network security enabling critical infrastructure Protection and NERC/CIP compliance
- Advanced automation capabilities for customized protection and control systems
- Simplified system integration and access to information through the use of multiple communication options and protocols, including native support for IEC 61850



# Technical Specifications

GW4 Technical Data			GW4-126	GW4-126			GW4-145	GW4-252	
Rated voltage		kV	630 - 4000	126	126	126	145	252	252
Rated Frequency		Hz	50	50	50	50	50	50	50
Rated current		A	40/4, 50/4	1600	2000	3150	2000	2500	3150
Rated short-time withstand current and duration		kA/s	100, 125	31.5/3	40/3	40/3	40/3	50/3	50/3
Rated peak withstand current		kA	140	80	100	100	100	125	125
Rated short-time power frequency withstand voltage(rms)	To earth	kV	160	230	230	230	275	460	395
	Between breaks	kV		230+70	230+70 265	265	315	530	460
Rated lightning impulse withstand voltage(peak)	To earth	kV	325	550	550	550	650	1050	950
	Between breaks	kV	375	550+100	550+100 630	630	750	1200	1050
Rated busbar transferring current		A	1600	1600	1600	1600	1600	2000	2000

GW7 Technical Data			GW7-252	GW7-363	GW7-420	GW7-550
Rated Voltage		kV	252	363	420	550
Rated Frequency		Hz	50	50	50	50
Rated Current		A	3150-5000	3150-5000	4000	6000
Rated short-time withstand current and duration		kA/s	50/3, 63/3	63/3	63/3	63/2
Rated peak withstand current		kA	125, 160	160	160	160
Rated short-time power frequency withstand voltage (rms)	To earth	kV	460	510	652	740
	Between breaks	kV	460+145	510+210	615+268	740+315
Rated lightning impulse withstand voltage(peak)	To earth	kV	1050	1175	1502	1675
	Between breaks	kV	1050+200	1175+205	1502+379	1675+450
Rated switching impulse withstand voltage	To earth	kV	/	950	1142	1300
	Between breaks	kV	/	850+295	1060+368	1175+450
Rated busbar transferring current		A	1600	1600	1600	1600

GW10/11 Technical Data			GW10/11-126	GW10/11-252	GW10/11-363	GW10/11-420	GW10/11-550
Rated Voltage		kV	126	252	363	420	550
Rated Frequency		Hz	50	50	50	50	50
Rated Current		A	2000	2500-5000	4000\5000	4000	4000
Rated short-time withstand current and duration		kA/s	40/3	50/3, 63/3	63/3	63/3	63/3
Rated peak withstand current		kA	100	125\160	160	160	160
Rated short-time power frequency withstand voltage (rms)	To earth	kV	230	460	510	652	740
	Between breaks	kV	230+70	460+145	510+210	615+268	740+315
Rated lightning impulse withstand voltage (peak)	To earth	kV	550	1050	1175	1502	1675
	Between breaks	kV	550+100	1050+200	1175+295	1502+379	1675+450
Rated switching impulse withstand voltage	To earth	kV	/	/	950	1142	1300
	Between breaks	kV	/	/	850+295	1060+368	1300+450
Switching capacitive current		A	1	1	2	2	2
Switching inductive current		A	0.5	0.5	1	1	0.7
Switching busbar transferring current Bus-transfer current		A	1600	1600	1600	1600	1600

GW6 Technical Data			GW6-126	GW6-252	GW6-550
Rated Voltage		kV	126	252	550
Rated Frequency		Hz	50	50	50
Rated Current		A	3150	4000	4000
Rated short-time withstand current and duration		kA/s	40/3	63/3	63/3
Rated peak withstand current		kA	100	160	160
Rated short-time power frequency withstand voltage (rms)	To earth	kV	230	460	740
	Between breaks	kV	230+70	460+145	740+315
Rated lightning impulse withstand voltage (peak)	To earth	kV	550	1050	1675
	Between breaks	kV	550+100	1050+200	1675+450
Rated switching impulse withstand voltage	To earth	kV	/	/	1300
	Between breaks	kV	/	/	1175+450
Rated busbar transferring current		A	1600	1600	1600
Switching capacitive current		A	1	1	
Switching inductive current		A	0.5	0.5	



## Digital Energy

Toll Free: +1 877-605-6777

Direct: +1 678-844-6777

[gedigitalenergy@ge.com](mailto:gedigitalenergy@ge.com)



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