

G&W

Engineered to order. Built to last.



Arc Resistant SF₆ Switches

ARC RESISTANT SWITCHES

Arc resistant SF6 insulated switches provide load and fault interrupting switching for systems rated through 38kV, 900A continuous and 25kA symmetrical interrupting.

Arc Resistant Tank Design

An internal arcing fault is an unintentional discharge of electrical energy within an enclosed structure. When the arcing fault occurs, the available short circuit current will flow through the arc between phases and/or from phase(s) to ground. The released energy from an electrical arc heats the SF6 gas or air within an enclosed structure, resulting in a pressure rise.

While incidence of an internal fault in medium voltage switches is very rare, when an arc fault occurs it may seriously damage the electrical equipment and its surroundings. There are two design strategies that can be used to create arc resistant switches that will prevent this from occurring:

1) Containment: The switch is able to withstand the pressure rise during the internal arc fault without rupture. No hot gases escape from the switch.

2) Rupture and vent: The switch is equipped with a rupture disc that ruptures at the preset pressure. Hot gases escape from the switch into the exhaust compartment where they will be either contained or directed away from the operator by a system of channels and vent flaps.

To maximize operator safety, G&W has created a distinct switch tank geometry to contain an internal arc fault of 25kA for 0.25 seconds in SF6 according to IEC62271-200 standard. The tank is able to withstand an internal



▲ Arc Resistant TNI.

pressure of 170psi maximum without rupturing. The ability to contain this pressure rise makes this tank design ideal for use in padmount and vault applications requiring no exhaust compartments, vents, or channels.

TESTING

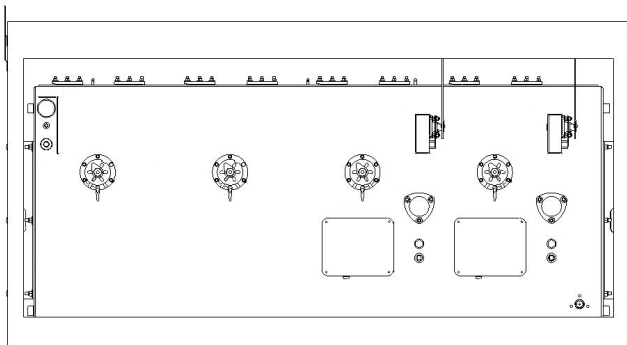
Arc Resistant Certified

Switches are designed and tested per applicable sections of IEEE C37.72, C37.74 C37.60, and IEC 265 standards. G&W switches tested to this standard are capable of withstanding the pressure rise associated with a 25kA, 0.25 second (15 cycle) fault in an SF₆ environment. This testing applies to all TNI and GNI switch styles from three to six way configurations.

SWITCHES

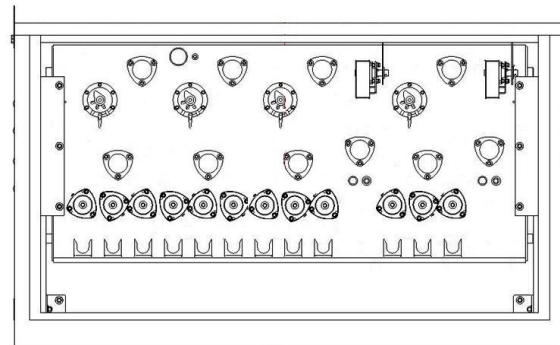
TNI

- Front Access Operators
- Rear Access Bushings
- 630A Switched Ways and Main Bus
- 630A Continuous Fault Interrupter Ways



GNI

- Front Access Operators
- Front Access Bushings
- 630A or 900A Switched Ways and Main Bus
- 630A Continuous Fault Interrupter Ways



FEATURES AND BENEFITS

Features	Benefits
Maximum Operator Safety	Load break switches incorporate a visible break of all three phases. Dead-front switch construction eliminates any exposed live parts.
Minimal Maintenance	A periodic check of the pressure gauge is all that is required.
Overcurrent Protection	Switches are available with overcurrent protection up to 25kA symmetrical. These switches include simple to use electronic controls to provide many settings for over current protection.
Robust, Corrosion Resistant Construction	The optional 304/304L stainless steel tank provides extra corrosion resistance. Switch tanks are fabricated with welded and gasketed seals, and extremely robust construction, to provide decades of reliable service

ELECTRICAL RATINGS

Voltage Class (kV)	15	25	35
Maximum Voltage (kV)	15.5	27	38
BIL Impulse (kV)	110	125	150
1 Min Withstand AC (kV)	35	60	70
1 Min Withstand Production test rating AC (kV)	34	40	50
15 Min Withstand DC (kV)	53	78	103
Continuous and load break current (A)*	630*	630*	630*
Momentary Current (kA) asym	40	40	40
Fault-Close 3-times (kA) asym	32**	32**	32**
1 Sec Current (kA) sym	25	25	25
Mechanical Operations	2000	2000	2000

* 900A continuous available

** 40kA available

IEEE C37.60 FAULT INTERRUPTING DUTY

Percent of Maximum Interrupting Rating	Approximate Interrupting Current, Amps	No. of Fault Interruptions
15-20%	2,000	44
45-55%	6,000	56
90-100%	12,500	16
Total Number of Fault Interruptions: 116		

ARC RESISTANT SWITCH STYLES

G&W Arc Resistant Switches combine the total cost and operating benefits of electronically controlled, resettable over-current protection with the safety and maintenance benefits of a totally sealed, dead-front, SF6 insulated device. The switches are designed for automatic three-phase fault interruption with manual load break for systems rated 15.5kV, 27kV, or 38kV; 630A and 900A load break and continuous current; and 25kA symmetrical fault interrupting ratings. All switched ways include integral grounding as well. Designs include front/ back access (TNI) or single side access (GNI) to provide the smallest possible foot print for confined areas.

Three Phase Switching

All G&W Arc Resistant switches use G&W's patented three position load break switch mechanisms (close/ open/ ground) and resettable vacuum fault interrupters with integral ground position.

Mechanisms

Three Position Linear Puffer

The ground position linear puffer is a 3-position device (close/ open/ ground) and is ideal for load break switching applications rated through 35kV, 630A and 900A continuous, and 40kA asymmetrical short circuit. G&W's linear puffer style contact system provides extremely efficient, high speed arc extinction for maximum service life.

The three position rotary puffer is a 3-position device (close/ open/ ground) and is ideal for manual load break switching applications rated through 35kV, 630A continuous, and 40/32kA asymmetrical momentary/close into short circuit ratings. G&W's rotary puffer style contact system provides extremely efficient, high speed arc extinction for maximum service life.

Vacuum Interrupter

The model NI vacuum interrupters consist of three vacuum bottles mechanically linked to a single spring-assisted operating mechanism. Once initiated, the interrupting time of the vacuum bottles is approximately 3 cycles (50 millisecond). A position indicator (open-green, closed-red) is driven by the operating mechanism and is visible through a viewing window for indication of contact position. The mechanical linkage assembly provides a "trip-free" operation permitting the vacuum interrupter to interrupt independent of the operating handle if closing into a faulted circuit. The model NI vacuum interrupter is rated to 38kV, 630 A continuous, and is available with a fault interrupting rating of 12.5 kA, 20 kA, or 25 kA sym.

Padmount, vault, or equipment room applications

G&W Arc Resistant Switches can be applied in vaults, equipment rooms or mounted on pads. For vault and equipment

room applications, the switch is supplied with appropriate mounting and support frames. Padlock provisions are also supplied for lock-out tag-out procedures. For padmounted switches, the switch is supplied with a 12-gauge galvanized steel enclosure or for maximum corrosion resistance, 304 or 316 stainless steel can be supplied. Standard enclosure colors include dark green (Munsell 7.0GY3.29/1.5) or light gray (ANSI 70). Enclosures can be specified with any paint color upon request.

APPLICATIONS

Transformer and Motor Protection

The three phase trip feature and high continuous current make G&W arc resistant rated switches ideal for protecting three phase motors and transformers.

Available 900A Loop Switching

For 15kV and 25kV applications 900A loop switching is accomplished using the latest puffer technology. Tap switching through 630A and up to 25kA symmetric fault protection is accomplished using resettable, electronically controlled vacuum interrupters. The vacuum interrupters also function as load break switches.

Metal Clad Switchgear Replacement

Front access designs can provide up to six 25kA symmetric protected fault interrupter ways for a compact, economical alternative to metal clad and metal enclosed lineups.

OPTIONS

Remote Monitoring

G&W can provide an optional low pressure monitoring device set at 5 psig for remote indication of internal tank pressure. Gas density monitoring devices permit remote indication of internal tank gas density to assure proper pressure/temperature operating conditions.

Ground Lugs

Every G&W switch comes with grounding provisions for elbow, cable, and system grounds but switches can also include bronze, eyebolt style ground lugs for 4/0 maximum conductor cable.

Auxiliary Contacts

Auxiliary contacts can be provided for remote monitoring of switch contact positions. The leads can be terminated to an optional junction box mounted on the switch's padmount enclosure. A maximum of two auxiliary switches can be installed per way.

Mounting Flexibility

Arc Resistant Switches come standard with 24" minimum bushing height, which can be increased to 42" for applications where more space is needed to train cables.