

Rapier GX

SF₆ enclosed Load Break Switch



Introduction to Rapier GX

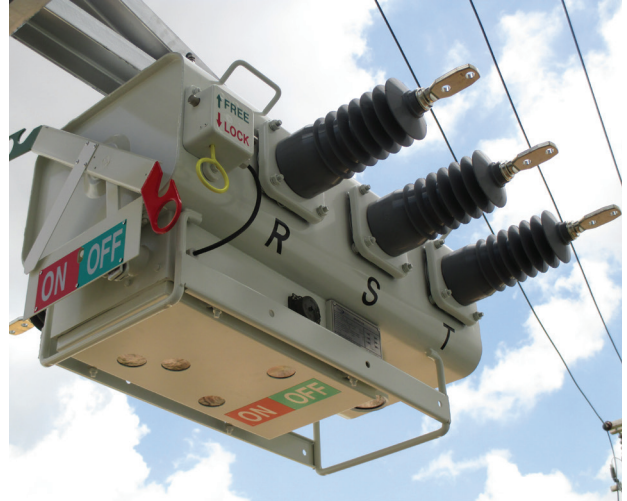
Rapier GX is a pole-mounted gas-enclosed switch developed to complement our overhead switchgear range. Designed as a load break switch, when connected to a Lucy Electric's remote terminal units (Gemini 3 range), Rapier GX performs as a sectionaliser unit.

Available up to 38kV, Rapier GX has been designed utilising the latest SF6 puffer switching technology to achieve high performance and reliability. The structural tank welding is performed by a robotic welding process to ensure the highest manufacturing standards.

Able to be operated manually via hookstick, locally via a control cabinet, or remotely using automation equipment, Rapier GX provides the answer to your sectionalising and network automation requirements.

Characteristics

- 17.5 kV, 24 kV, and 38 kV ratings
- Stainless steel tank sealed for life
- Internal arc classification
- Overpressure bursting disc
- Gas pressure indicator
- Low gas pressure lockout device
- Independent spring opening and closing for consistent operating speed
- Permanent hookstick operating lever
- Lock-off device
- Polymeric bushings
- Ability to be used as a sectionaliser



Built to last

All switch tanks are manufactured from stainless steel, sealed for life and maintenance free. The "tulip" type contact system ensures long contact life and high short-circuit making capability up to 41.6 kA. Load breaking up to 630 A is achieved with very short arcing times of less than half a cycle of power frequency. Full ratings are guaranteed at atmospheric gas pressure.

The standard operating mechanism is an independent manual spring for fast open, fast close GX switch operations. Motor operation time takes less than 700 milliseconds. Bushings are manufactured from polymeric materials to maximise protection against the weather and vandalism.

Safe operation by design

A number of safety features have been designed into the GX switch, ensuring maximum operator safety.

From ground level, an operator has visibility of status of the switch underneath the switch tank and if low gas pressure mechanism has operated then the switch remains in its current state.

A software feature in the remote terminal unit (RTU) ensures that any remote or local electrical operation is duly inhibited, if a low gas pressure is detected.

The operator is protected from an internal arc fault by the operation of a bursting membrane, such that exhaust debris is directed away from the operator. In addition, a low pressure lock-out device operates to inhibit mechanical and electrical operation of the switch in the event of low gas pressure.

On isolating the GX switch to establish a Point of Isolation, a lock handle can be operated to lock-off the mechanism. The lock-off must be returned to its normal position before the GX can be operated.

Automation and remote control

When the GX switch is combined with the RTU cabinet via a multi-core cable, Lucy Electric can offer a remotely controlled load break switch and sectionaliser.

The automated GX switch is equipped with all the necessary hardware and software features to operate as a remotely controlled load break switch or sectionaliser, working in conjunction with an upstream recloser.

All mounting steelwork for the GX switch, control cabinet and voltage transformer (VT) is normally supplied as standard to fit the variety of pole structures installed worldwide.

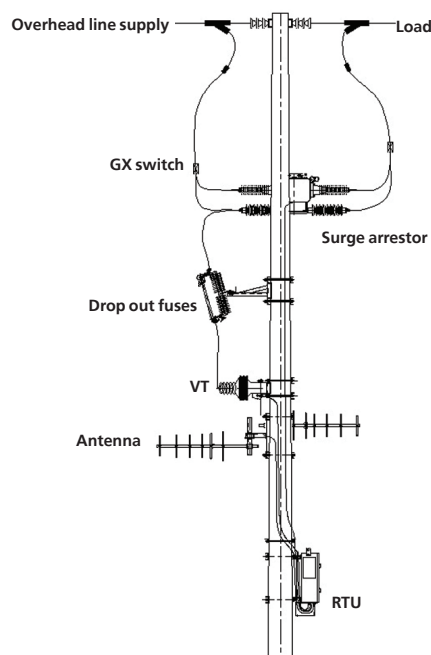
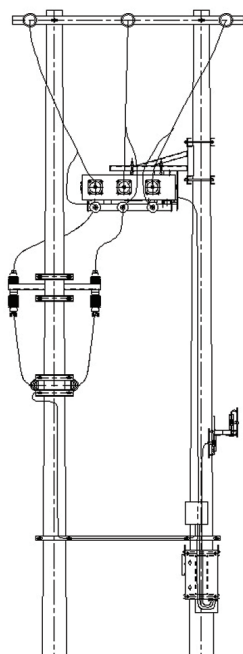
Optional features

- Communications modem
- Pole-mounted VT and bracket
- Integral VT within the GX switch tank
- Longer control cable (8 metres standard)
- Surge arrester brackets

Product offering

Available in the fully automated and motorised local control formats, Rapier GX provides customers with all the necessary features to meet applications for remote medium voltage switching and sectionalising. This is the ideal solution for locations where there is the likelihood of upgrading to automation in the future.

For situations where automation is not required, Lucy Electric offers a manual operated version of GX using a hookstick to drive a spring. Lucy Electric also supplies all the necessary mounting steelwork for any type of structure.



Smart-grid ready

RTU integration

Gemini 3 is a highly flexible, general-purpose Remote Terminal Unit designed to remotely monitor and control medium and high voltage switchgear.

The Gemini 3 has a modular design such that it can be configured from a simple monitoring only device to a fully functional automated switch controller. It has the ability to transition from a basic to an advanced RTU by plugging in additional modules. These modules are rugged, making the device field serviceable and future proof.

Key features of Gemini 3

- Embedded sectionalising and change-over functions
- Real time network condition monitoring of voltage, current, power, power factor and frequency
- Flexible communication through radio, RS232, RS485, packet data network, GSM, GPRS, PSTN, ethernet, TCP/IP and optical fibre.
- Advanced battery pack to operate under mains AC input failure
- Fully tested to ENATS (Energy Network Association Technical Standards), EMC and environmental standards

Benefits of Automation

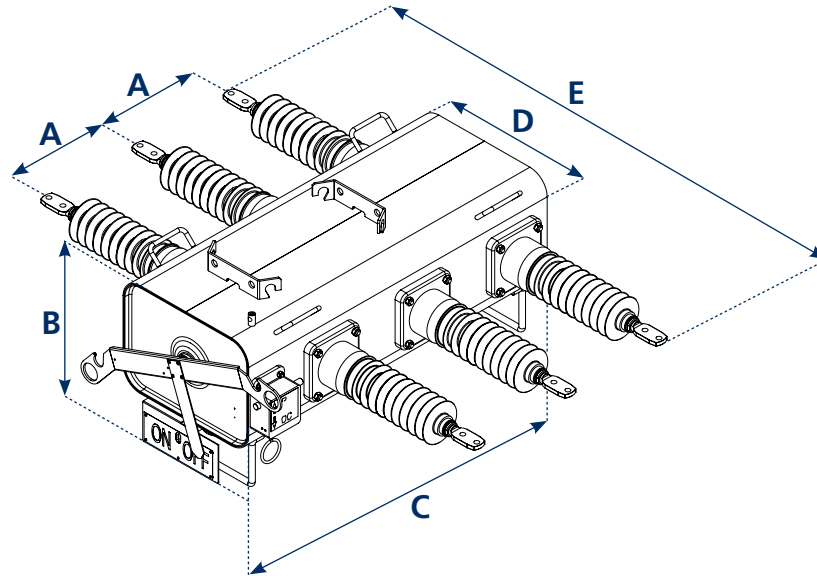
- Reduced time in diagnosing system anomalies as well as locating and isolating faulty sections of the network
- Faster response time and quick network reconfiguration
- Optimisation of asset management through the implementation of customised automation schemes
- Reduced operational cost associated with routine network switching
- Increased operator safety

Characteristics

- Fault detection (Earth and Phase)
- LED status indicators
- Real time clock (SCADA synchronised)
- Dual isolated Ethernet and RS232 ports
- Isolated RS485 port
- Supervisory selection and indication
- Event memory – 7000 events in non-volatile memory
- Communication protocol
 - DNP 3.0 TCP/IP or Serial
 - IEC 60870-5-101
 - IEC 60870-5-104
 - Modbus TCP or RTU
- Maintenance free



General arrangement drawing



Dimensions (mm)

	A	B	C	D	E
17.5 kV	250	470 ^(a) /520 ^(b)	900	400	1120
24 kV	290	470 ^(a) /520 ^(b)	980	400	1380
38 kV	350	470 ^(a) /520 ^(b)	1170	400	1530

*(a) = Manual version (b) = Motorised version

Electrical performance

Technical Data				
Rated voltage	kV	17.5	24 kV	38 kV
Frequency	Hz	50/60	50/60*	50/60
Rated normal current	A	630	630	630
Power frequency withstand voltage (rms)	kV	95/110	125/150	150/195
Lightning impulse withstand voltage (peak)	kV	38/45	50/60	70/80
Current ratings				
Rated short time withstand current		16 kA, 1 sec	16 kA, 1 sec	16 kA, 1 sec
Rated peak withstand current	kA	41.6	31.3/40	32.5
Internal arc protection		Type C - 16 kA, 1 sec		
Operation performance				
Operating temperature	°C	-25 to +55	-25 to +50	-25 to +55
Altitude		Up to 1000 m (without de-rating)		
Mechanical endurance class	class	M2	M2	M2
Number of mechanical operations	ops.	5000	5000	5000
Number of load-break operations	ops.	100	100	400
Electrical endurance class (Load Break)	class	E3	E3	E3
Number of short-circuit making operations	ops.	5	5	5
Capacitive current class	class	C2	C2	C1
General information				
Insulator type		Polymetric bushings		
Bushing creepage distance	mm	525	768	1082
Gas enclosure ingress protection	Class	IP65		

24 kV unit tested at 50 Hz, but valid for both 50 and 60 Hz, as per IEC 62271

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