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## LIGHTNING Incorporating the NDC Circuit Breaker

The BRUSH Switchgear Lightning product, incorporating the high-speed NDC Circuit Breaker, utilises award winning magnetic actuator technology and provides an innovative DC switchgear solution for a variety of markets and demanding applications.

Combining innovation with 50 years of DC circuit breaker design and manufacturing experience, the Lightning offers optimal safety, reliability and high speed performance – the ideal solution to your DC requirements.

### Key Features

- Superior proven technology with minimal maintenance
- A long service life designed to exceed 30 years
- Superior compact design concept and operating mechanisms
- High speed operation, direct overload and electrical tripping

- Simple, reliable mechanism with no mechanical latch
- Ergonomic, intuitive truck isolation and interlocking
- Enhanced electrical and mechanical endurance
- Patented Arc transfer coil
- Fully bi-directional current interruption
- Hard wearing main contact material (silver tungsten carbide) ensuring long life
- Integrated operation with a wide range of protection relay options



### Ratings

Rated Voltage	V dc	900	1800
Rated Service Current	A	4000/6000/8000	4000/6000
Nominal Voltage	V dc	750	1500
Power-Frequency Withstand Level	kV	9	9
Rated Short-Time Withstand Current	kAp/kA	100/71 250ms	100/71 250ms
Rated Track Time-Constant	ms	100	63
Rated Short-Circuit Current	kAp/kA	180/125	142/100
Bi-directional Critical Current **	A	25	25
Mechanical Endurance		50,000 operations	50,000 operations
Breaking Characteristic		High Speed	High Speed
Insulation Category		OV4	OV4
Rated Impulse Withstand kVp		20	20
Auxiliary Operating Supply	V dc	48 / 50 / 110 / 125	48 / 50 / 110 / 125

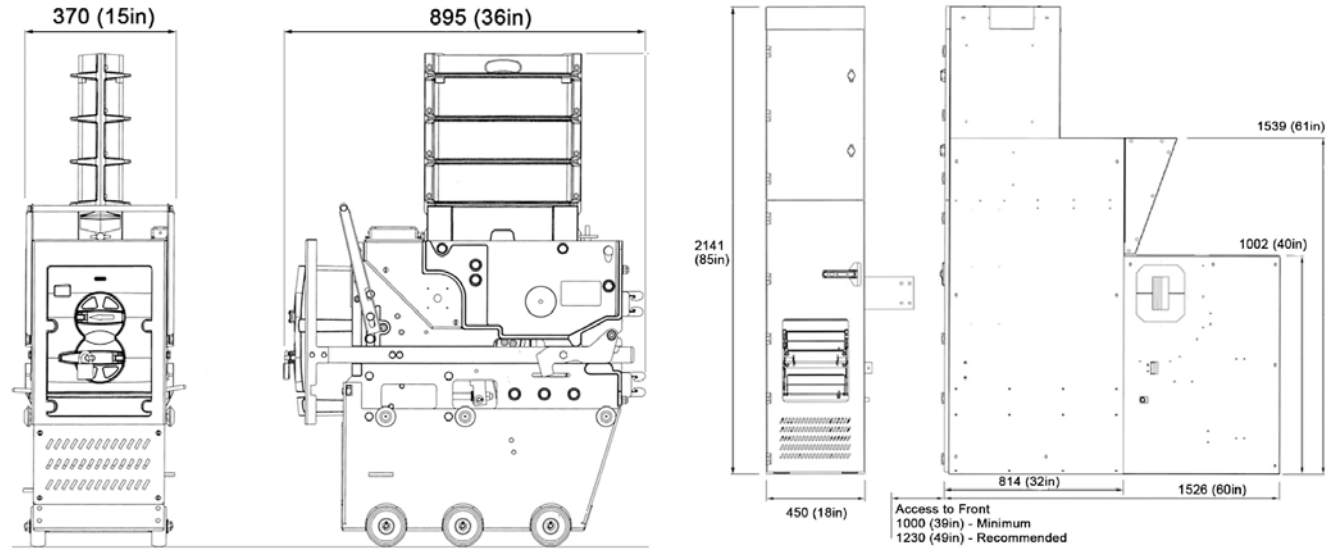
\*\* As defined in BS EN50123-1: 2003, the critical current quoted is the current with the longest arcing time. At 900V/25A the arcing time is approximately 330ms

The circuit breaker enclosure has been subjected to an internal arc withstand test in accordance to the requirements of IEC 60694: 2002 and IEC 62271: 2003.

### Typical Weights

	900V dc	1800V dc
4000A Feeder panel	580kg (1276lbs)	620kg (1364lbs)
6000A Feeder panel	600kg (1320lbs)	640kg (1408lbs)
6000A Rectifier panel	600kg (1320lbs)	640kg (1408lbs)

### Dimensions (mm)



### Standards

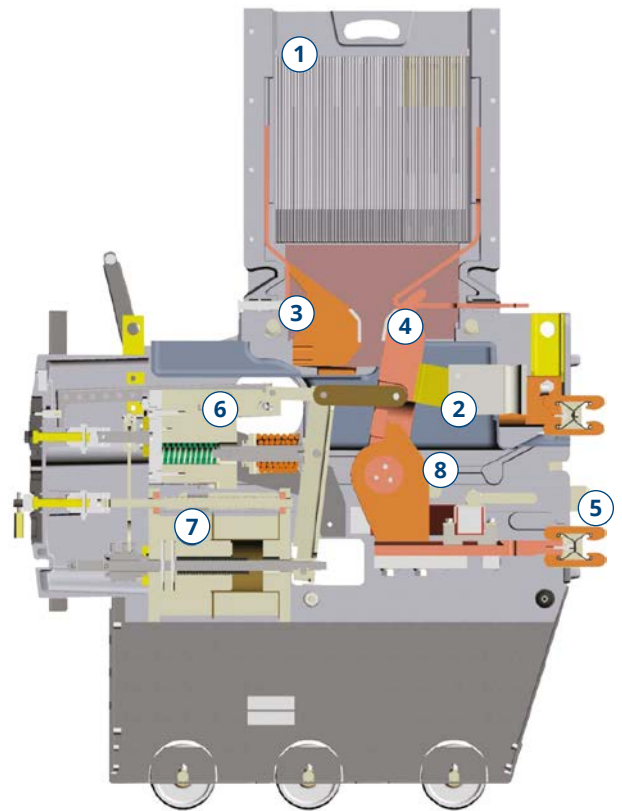
- BS EN 50123-1: 2003
- BS EN 50123-2: 2003
- BS EN 50123-6: 2003
- ANSI C37.14: 2002
- ANSI C37.16: 2000
- ANSI C37.20.1: 2002

### Patents

- GB2347272
- GB 2369246 B
- Network Rail Certificate of Acceptance PA05/01824

### NDC Circuit Breaker Mechanical Features

- 1 The patented arc transfer system prevents internal contamination of the circuit breaker compartment and cubicle. The Cold Cathode Arc Chute Assembly (1) dissipates all arcs whilst the transfer coil (2) provides additional magnetic flux across the contact gap, assisting with the interruption of low currents that would otherwise lead to long arcing times
- 2 Moving Contact Assembly
- 3 Fixed Contact
- 4 Primary disconnects
- 5 The patented Magnetic Latch mechanism provides the primary means of 'high speed' tripping of the circuit breaker. Working in conjunction with the Magnetic Actuator, the latch directly holds the circuit breaker contacts closed
- 6 The Magnetic Actuator is based on a solenoid plunger, and provides the motion required to close the main contacts and to reset the latch device on tripping
- 7 The uni-directional Direct Acting Release trips the circuit breaker when the current in the main circuit exceeds the overload setting



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