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## BSR The Retrofit Solution

The BSR is an OEM designed retrofit circuit breaker for both the BRUSH Switchgear VSI range of Oil Circuit Breakers and the VMV vacuum Circuit Breaker, to IEC 62271-100.



BRUSH Switchgear is proud of its heritage in the VSI, VTD & VMV range of switchgear, which continue to work at the highest standards today.

Technological advances have allowed us to improve further and offer our customers a circuit breaker that boasts the award-winning magnetic actuator technology.

The BSR circuit breaker, offers a new lease of life for existing switchgear, with this effective retrofit solution.

Employing award-winning magnetic actuator technology with vacuum interrupters, the BSR is designed for 10,000 operations and a life expectancy of 30 years. It is designed for retrofitting into existing switchboards without the need for panel modification.



### Key Benefits to Retrofit

- Superior, proven technology with minimal maintenance
- Remove the need for high capacity auxiliary supplies
- No civil works required and existing HV cabling remains undisturbed
- Improvement of Health & Safety by removal of oil
- Considerable life extension of the existing switchgear
- Lower owner costs through virtually no maintenance requirements and increased switchboard life expectancy
- Uses existing design of primary and automatic secondary contacts
- Improved panel interlocking to latest ENA requirements
- In addition to the retrofit of the circuit breaker BRUSH Switchgear can offer a more complete system solution to enhance the control and automation of the distribution network

### Ratings

Rated Values - Common	kV	12
Normal Rated Currents	A	630, 1250, 2000
Rated Voltage	kV	12
Lightning Impulse Withstand Voltage	kVP	75/95
Short Duration Power Frequency Withstand Voltage	kV	28
Rated Frequency	Hz	50
Rated Short-Time Withstand Current	kA	25
Rated Peak Withstand Current	kA Peak	62.5
Rated Duration of Short Circuit	Seconds	3
Making Current (peak)	kA	62.5
Symmetrical Breaking Current	kA	25
Rated Short-Time Current (3 sec)	kA	25
Rated Auxiliary Voltages	V dc	30, 48/50, 110/125
Minimum opening time/closing time	ms	33ms/76ms
Normal Operations		10,000
Weight	Kg	211
Rated Operating Sequence	O-0.3s-CO-15s-Co	
Operating Mechanism Type	Dependent power closing (Magnetic actuator); Stored energy opening (Springs charged during closing stroke)	



### VSI/VTD Circuit Breaker

The BRUSH range of VSI and VTD oil circuit breakers was manufactured between 1963 and 1990 by BRUSH Switchgear boasting a global install base.

The BRUSH range of oil circuit breakers have provided excellent service in both the 11kV primary and 6.6kV and 3.3kV secondary substation application.

However, both time and development have offered us improved technology and mechanical endurance, which are present in the BSR retrofit circuit breaker, offering 10,000 operations and 30 year life expectancy.

### Standards

- ENA Technical Specification 41-36 Issue 3
- Parts 1, & 2: 2012
- ENA Technical Specification 50-18: 2008
- ENA Technical Specification 50-19: 2003



### VMV Circuit Breaker

In 1990, the VMV circuit breaker was introduced as a type-tested, direct replacement for the VSI/VTD circuit breakers, employing vacuum interrupter technology. The fundamentals of the design ensured the upgrade from oil to vacuum circuit breakers was a safe and easy operation, moving away from traditional insulation materials to the much more durable and robust cast epoxy resin.

The VMV circuit breaker and housing was used as our product offering for 11kV, 6.6kV & 3.3kV switchboard applications.

### STL Guides

- ISO 9001: 2008
- IEC 62271-100: 2003
- IEC 60529: 2001
- IEC 62271-1: 2007

### Additional Technical Information/Testing

		BSR
Rated Short-Circuit Breaking Current	kA	25
Rated Short-Circuit Making Current	kA Peak	62.5
Rated Capacitive Switching Currents	Class	C1
Rated Line-Charging Breaking Current	A	10
Rated Cable-Charging Breaking Current	A	25
Out of Phase Making and Breaking Current	kA	6.25
Rated Single Capacitor Bank Breaking Current	A	400
Double earth Fault	kA (0.87 x I <sub>sc</sub> )	21.8
Single Phase Fault	kA (I <sub>sc</sub> at 12/√3kV)	25
D.C. Time Constant	ms	45
D.C. Component	%	45
Rated Break Time	ms max.	45
Classification for Mechanical Endurance	Class	M2 (10,000 operations)
Classification for Electrical Endurance	Class	Class E2 List 1 (Table 21 of IEC 62271-100)
<b>Integral Earthing</b>		
Rated Short Time Withstand Current	kA	25 (3 seconds)
Rated Short-Circuit Making Current	kA Peak	62.5
Rated Short Time Withstand Current	kA	13.1 (3 seconds)
Rated Short Circuit Making	kA Peak	33

### BRUSH

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