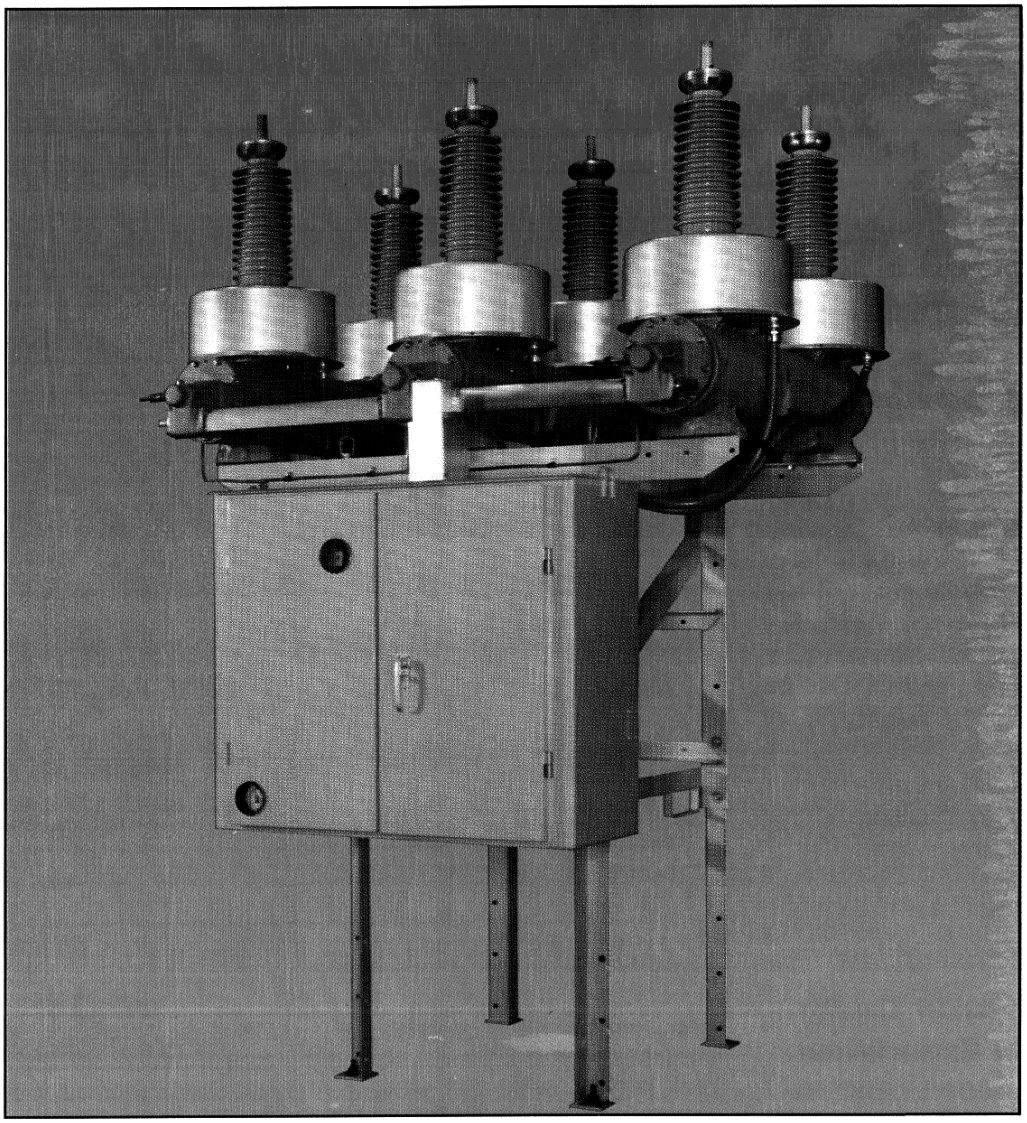
ABB
ASEA BROWN BOVERI

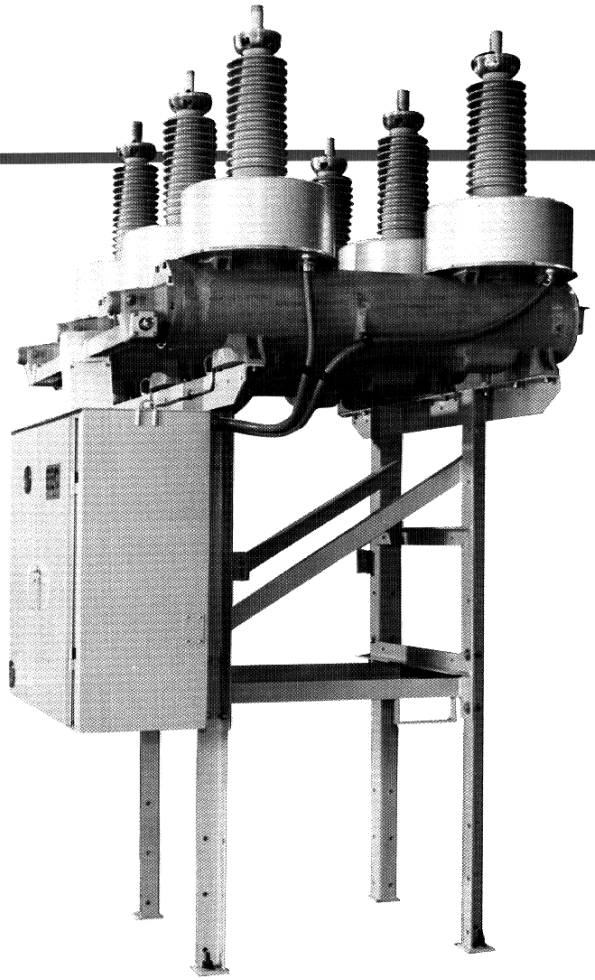
Type PM
SF_6 Power Circuit Breakers
38 Through 72.5 kV



HELPING SHAPE AMERICA'S ELECTRICAL FUTURE

ASEA BROWN BOVERI

Another Leader Is Born



FEATURES

- SF_6 State of the Art Interrupter Design
- Dead Tank Design
- Spring Operating Mechanism
- Single Interrupter Per Phase
- Three Tank Construction
- Bushing Current Transformers
- Porcelain Bushings
- Compact and Simple Design
- Shipped Fully Assembled and Factory Tested

USER BENEFITS

- Minimum Maintenance
- Reduced Foundation Requirements
- Reduced Installation Time
- No Oil Handling
- High Speed Interruption
- Out of Phase Switching
- Capacitor Bank Switching
- Seismic Capability
- Suitable for -40 C Ambient
- 40 kA Interrupting Capability without Capacitors

RATINGS

Breaker	Maximum KV, RMS	Continuous A, RMS	Interrupting KA, RMS	60 HZ Freq. KV	BIL KV Crest	Chopped Wave KV Crest 2 μs	Chopped Wave KV Crest 3 μs
38PM31/40	38	1200 1600 2000 3000	31.5 40	80	200	258	230
48PM31/40	48.3	1200 1600 2000 3000	31.5 40	105	250	322	288
72PM31/40	72.5	1200 1600 2000 3000	31.5 40	160	350	452	402

31.5 KV RATED BREAKERS HAVE 3 CYCLE INTERRUPTING TIME AND 40 KA UNITS HAVE 5 CYCLE INTERRUPTING TIME.

An SF_6 Breaker Design Based on Experience

The PM Breaker is designed with components and experience gained through other quality ASEA Brown Boveri SF_6 Breakers. This operating experience and the unequalled performance records of SF_6 Breakers stands as a model for the new PM Breaker design.

The SF_6 Breaker consists of three cast aluminum tanks containing interrupter units which are mounted on a single support frame. Moving contacts are operated by the spring mechanism. The three pole units have a common SF_6 gas system monitored by a gas density monitor. The rated SF_6 gas pressure is 65 PSIG at 20 C. The Control Cabinet houses relevant control elements and the Spring Drive Mechanism.

This simple, yet practical, design is shipped fully assembled and tested. Thus the breaker only needs SF_6 gas to be added at the jobsite. Each breaker is shipped with positive SF_6 gas pressure (5 psig).

ANSI Standards for 121 KV and above require power circuit breakers to successfully interrupt short line fault conditions. Although short line fault tests are not required for 72.5 kV breakers, the PM type breaker has been tested for 90%-40 kA short line faults without the assistance of line to ground capacitors.

Featuring An Advanced Interrupter Design

The 38/72 PM Circuit Breaker has been developed as a result of the well proven success of other ASEA Brown Boveri high voltage breaker designs. The interrupter operates as a puffer breaker on low currents. For high current interruptions, the arc generates pressure when the arcing contacts begin to open. The resulting gas pressure surge enables the fault current to be interrupted.

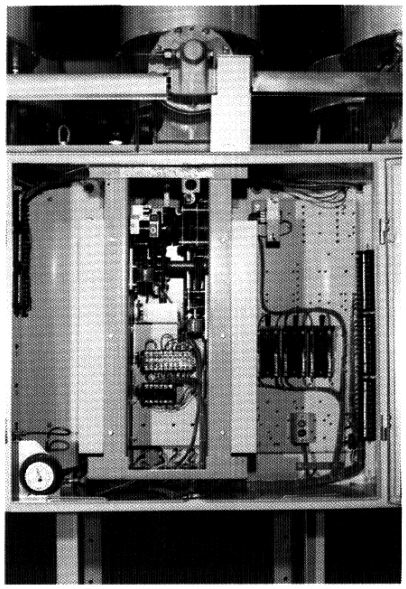
This "extinction principle" permits the use of a relatively simple, low energy mechanism. Lower mechanism energies result in lower mechanical stresses on structures and foundations during breaker operation.

The interrupter unit has separate main and arcing contacts. This enables the user to have the same long maintenance interval as other ASEA Brown Boveri puffer designs. Each interrupter unit is connected to the mechanism using a field proven linkage design.

Spring Drive Operating Mechanism

The PM Breaker incorporates a type FSA2 Spring Drive Mechanism, the same type employed on other highly successful ASEA Brown Boveri live tank breakers.

Two pairs of springs are used for both closing and opening. The principle behind the operation is as follows:



Initial Charging of the Mechanism

A charging motor "charges" a pair of closing springs via a reduction and worm gear. These closing springs are connected to a switch that disconnects power to the charging motor after the springs are charged.

Closing Operation

When the closing coil is energized the closing solenoid releases the closing springs, which rotate the main shaft. The main shaft, in turn, moves the drive shaft through a cam. The drive shaft, which is connected to the moving contacts of the breaker, turns and closes the breaker. The opening springs are charged during this closing operation.

Following the closing operation the motor "charges" the closing springs within ten seconds.

Opening Operation

When the trip coil is energized, the trip solenoid releases the drive shaft and latch. This allows the opening spring to rotate the drive shaft and open the breaker.

In the event of a power loss, a breaker in the normal closed position can complete an open-close-open cycle with energy stored in the mechanism. The mechanism can also be manually charged with a hand crank.

An hydraulic shock absorber in the mechanism dampens the closing and opening operations, protecting the mechanism and breaker from undue mechanical stress.

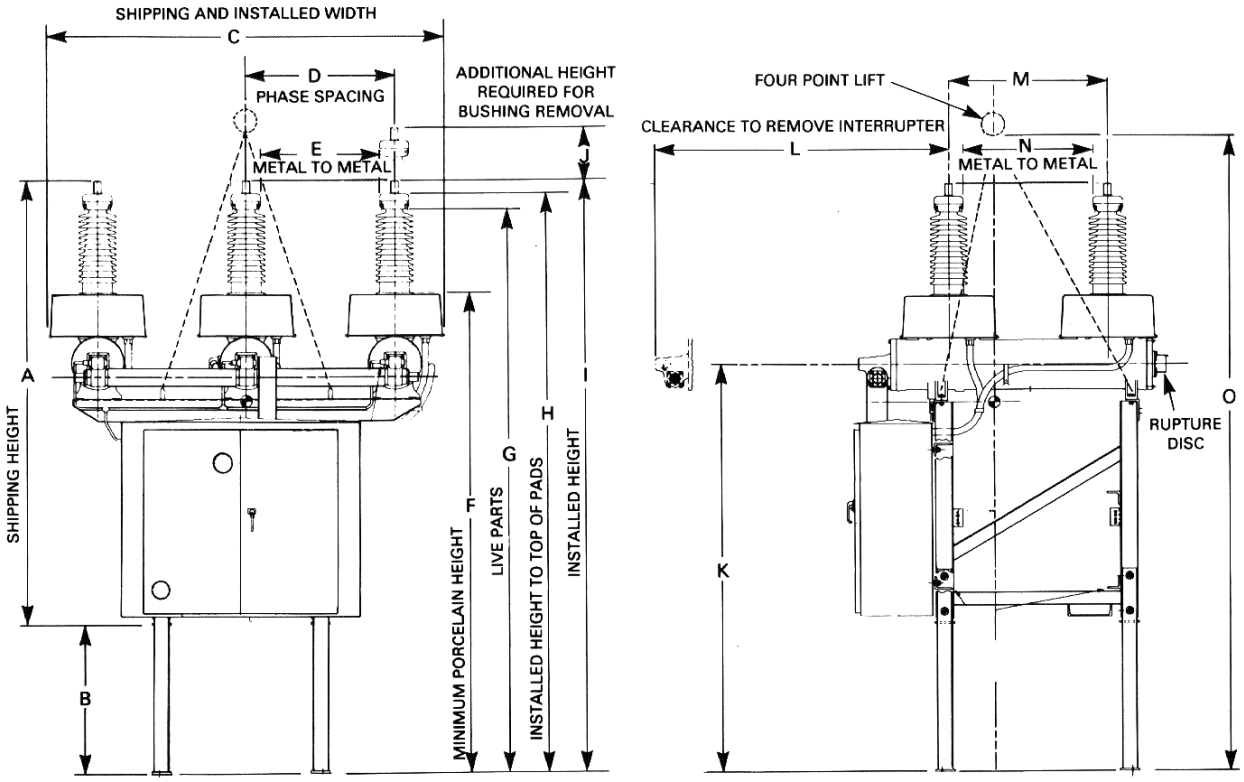
Control Cabinet

The control cabinet houses the spring mechanism, current transformer terminal blocks and the electrical control components. These controls include electrical relays, the SF_6 gas density monitor, pressure gauge and all control switches. The terminal blocks for internal and customer connections are readily accessible.

Mechanically driven 10 stage auxillary switches are adjustable and can be converted from 'a' to 'b' contacts. The operating controls are surface mounted on a panel within the cabinet.

Current Transformers

The current transformers are located on the external portion of the breaker SF_6 system for maximum accessibility. Each bushing can accommodate up to three current transformers, depending on the accuracy and ratio. The current transformers can be replaced or changed in the field without removing the bushings.



DIMENSION IN INCHES														
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
100⅝"	33⅞"	89⅞"	33⅝"	27"	109"	128"	131½"	134½"	12"	99 3/32"	66⅞"	36 5/32"	29½"	145½"

Bushings

The bushings are equipped with a porcelain weathershed. Each breaker is shipped with the bushings installed and tested. Voltage stress at the lower end of the porcelain weathershed is effectively graded by internal shielding. The bushings are designed to meet or exceed all applicable ANSI and NEMA design specifications.

Optional high-creep and high altitude bushings are available.

Shipping and Installation

ASEA Brown Boveri PM power circuit breakers are shipped fully assembled. By extending the breaker legs, mounting the breaker on the pad and adding the required quantity of SF_6 gas the breaker is ready for testing and service.

A field assembly kit and installation manual are shipped with each PM breaker. Call our High Voltage Equipment Division for additional assistance if required.

ASEA BROWN BOVERI

Excellence in SF_6 Technology

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