

## Westinghouse Medium Voltage Vacuum Circuit Breakers

Type VCP-W and Type VCPW-SE

ANSI 5-15 kV at 250-1500MVA

1200-3000 Amperes.

IEC 3.6-17.5 kV at 40 kA

630-2000 Amperes, 40-95 kV BIL

Introducing two World Class Circuit Breakers, the Type VCP-W and Type VCPW-SE, from the World Leader in Vacuum Technology. Designed with over 70 years of power circuit breaker experience to be environmentally safe, reliable and maintenance free.



Cutler-Hammer

**EAT•N**



## Westinghouse & Cutler-Hammer Products

World Class Vacuum Technology, the best electrical connection, and a time-proven reliable mechanism make the VCP-W Breaker the smart choice

The Westinghouse 5/15 kV Type VCP-W is the cornerstone of the Cutler-Hammer Medium Voltage Vacuum Circuit breaker family. With over 10 years of proven reliability, the Type VCP-W has become the industry standard for utility and industrial markets around the world. Our vacuum circuit breakers were specifically designed to meet and exceed ANSI, IEEE, NEMA, and IEC standards. Local codes can be met with a UL listed option for breakers and switchgear.

Our "Special Environment" Type VCPW-SE is designed with superior cycloaliphatic insulation components for use in harsh industrial environments.

### A Variety of Applications

The Type VCP-W and VCPW-SE Vacuum Circuit Breakers are ideal for use in new switchgear, as well as for modernization and life extension of existing switchgear.

No matter what the application, these 5/15 kV Vacuum Circuit Breakers will meet industry requirements for greater safety, quality, superior reliability, and minimal maintenance. Cutler-Hammer now provides the industry's most complete family of technologically advanced circuit breakers in ANSI voltages of 5 kV, 15 kV, 27 kV, and 38 kV and IEC ratings of 3.6 kV to 36 kV.

### Quality and Reliability are Built-In

Type VCP-W and VCPW-SE Circuit Breakers are designed for reliability and minimal maintenance ... a direct result of engineering with proven components, quality materials and fewer moving parts.

Both the Type VCP-W and VCPW-SE Vacuum Circuit Breakers are assembled in an ISO 9002 certified facility and are provided with a unique Quality Assurance Certificate that documents all tests and inspections performed.

### World Leading Credentials

Cutler-Hammer is a world leader in vacuum interrupters and vacuum circuit breakers. The Type VCP-W and VCPW-SE Vacuum Circuit Breakers incorporate many design features which have been field proven through 25 years of vacuum interrupter design and manufacturing experience... coupled with over 70 years of power circuit breaker design and manufacturing experience.

### Maintenance Free Vacuum Technology

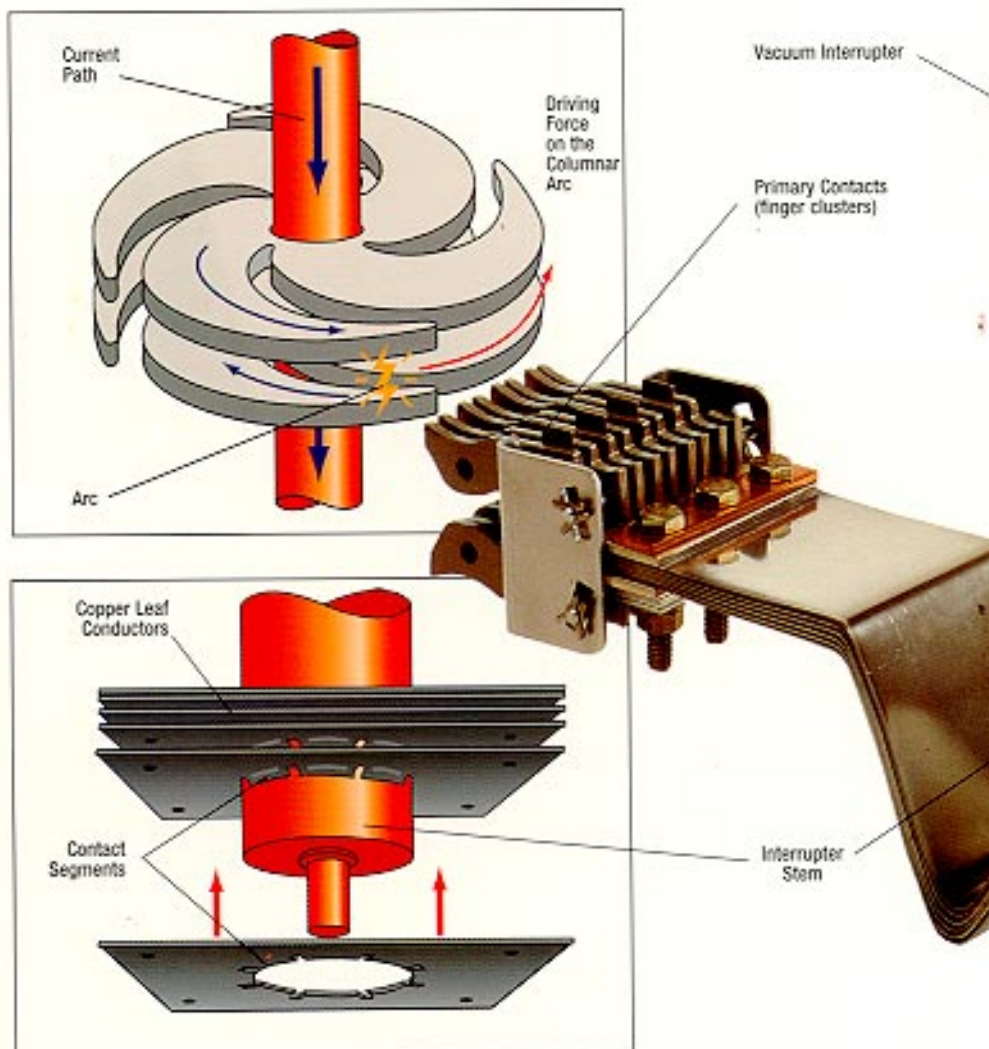
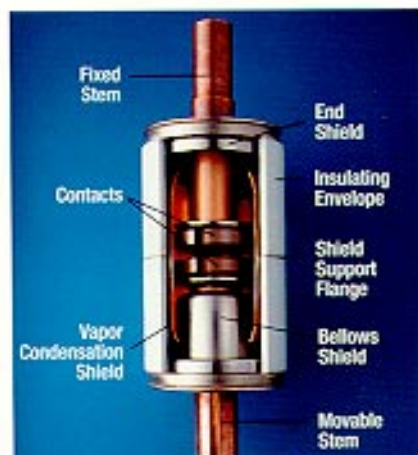
Spiral copper-chrome contacts provide superior performance characteristics, including lower chop currents. The spiral contact design provides a self-induced magnetic effect that moves the arc root around the contact periphery. This very efficient arc control prevents hot spots which minimizes contact erosion.

### The Industry's Best System for an Electrical Connection to a Vacuum Interrupter

Our nonsliding current transfer system consists of a series of tin-plated, high-conductivity copper leaf conductors that are swaged onto the vacuum stems:

- Providing improved current flow through the increased surface area (skin effect) of the multiple conductors while the multi-point contacts offer very low electrical and thermal resistance.
- Unlike sliding or rolling designs, there are no moving parts to wearout...therefore, no maintenance resulting in longer circuit breaker life.

Plus, our unique, patented V-Flex system allows for vacuum stem movement without creating any additional friction or wear. Fewer moving parts and a shorter stroke provide for a simpler and more compact, low energy mechanism with longer life and greater reliability.





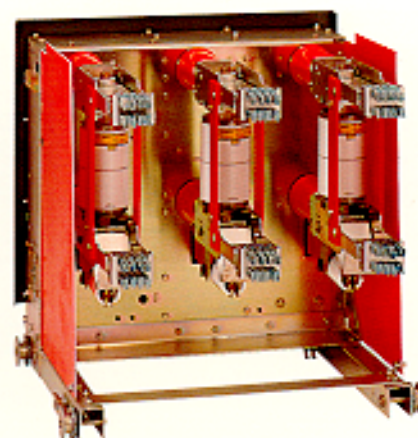
## Westinghouse Medium Voltage Vacuum Circuit Breakers

Easy access and safety features are built-in with our user-friendly control panel, easy access mechanism, and superior safety features

### Type 5/15 kV VCP-W

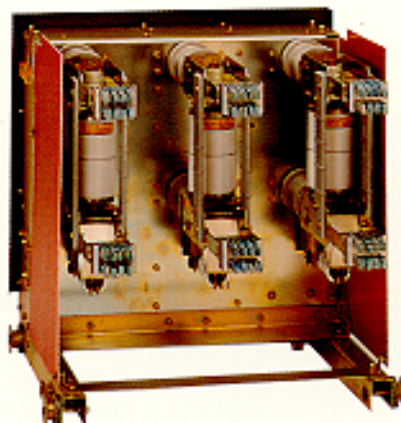


Controls and indicators are functionally grouped on the front panel of the VCP-W breaker for user friendly operation.

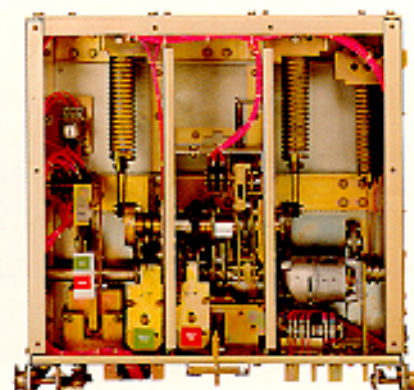


Type VCP-W Circuit Breaker, shown from rear, features glass polyester insulation.

### Type 5/15 kV VCPW-SE

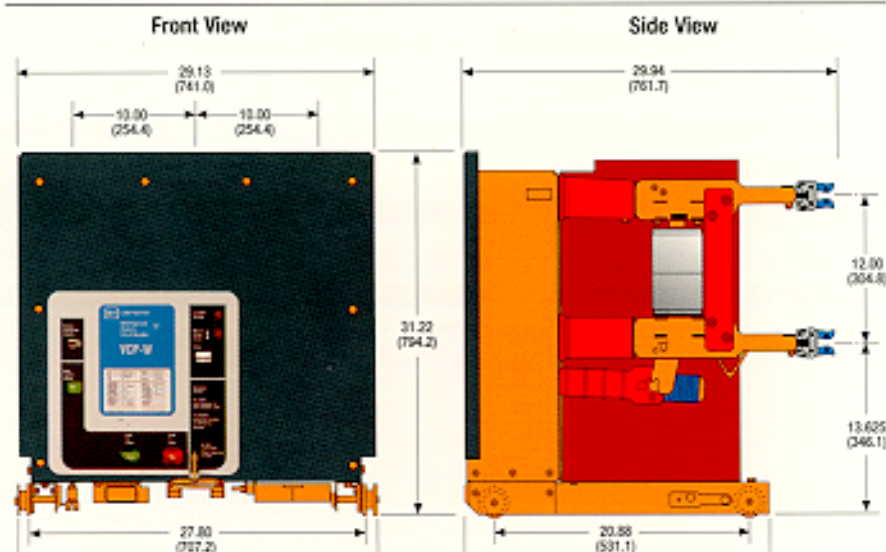


Type VCPW-SE Circuit Breaker, shown from rear, features cycloaliphatic epoxy insulation.



Type VCPW-SE Circuit Breaker with dead front panel removed allows for easy access for inspection and maintenance.

### Type 5/15 kV VCP-W and VCPW-SE Dimensions - Inches (mm)



Copper Leaf Conductors

Patented V-Flex Design



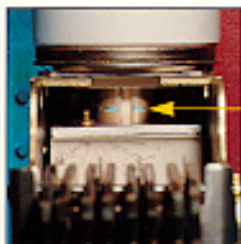
## Westinghouse Medium Voltage Vacuum Circuit Breakers

Cutler-Hammer is setting the standard with the industry's most complete line of Medium Voltage Vacuum Circuit Breakers

### Designed for Easy Inspection, Access and Minimal Maintenance

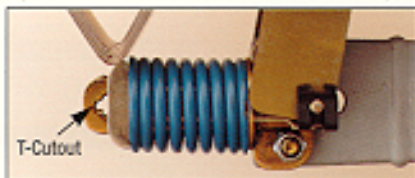
#### Two simple methods to inspect for proper breaker operation

Removing the circuit breaker front panel provides access to the stored energy mechanism and control components, facilitating ease of inspection. Minor maintenance when required, such as lubricating the mechanism and accessing the control components, is simplified.



Contact Erosion Indicator

After withdrawing the circuit breaker from the compartment on removable extension rails, the contact erosion indicator (one for each vacuum interrupter) can be visually inspected. When the circuit breaker is in the closed position, the T-cutout (contact wipe spring indicator) can be visually inspected. If the T-cutout is seen, the contact wipe springs are applying proper contact pressure. Only occasional visual inspection is required.



T-Cutout

### Designed to Provide Optimum Operator Safety

- **Double dead front shields** isolate the operator from high voltage when the breaker is energized. Additionally, the circuit breaker can be connected or disconnected with the compartment door closed by utilizing an electric levering device or a manually operated levering device.
- **True mechanically and electrically trip-free stored energy mechanism design** means that while holding a mechanical trip command, the breaker contacts will not close or touch even if an electrical or mechanical close command is received.
- **Safety interlocks** provide added operator safety. The mechanism is held mechanically trip-free when levering the circuit breaker in or out. Additionally, closing springs will discharge automatically when the breaker is being withdrawn or inserted into its compartment.

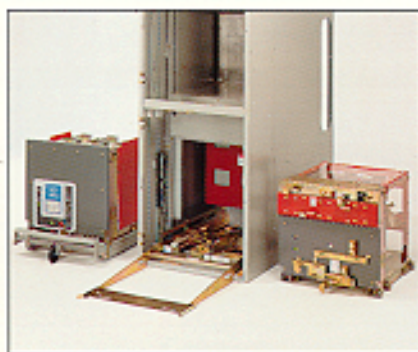
#### Type VCPW-SE Special Features

The Type VCPW-SE features superior cycloaliphatic epoxy insulation which has consistently demonstrated outstanding electrical and mechanical characteristics such as track resistance, dielectric strength, and fungus resistance. The breaker's critical phase-to-ground insulation utilizes cycloaliphatic epoxy due to its proven superior performance, even in the harshest industrial environments.

VCPW-SE features nuclear-rated control wire and ring type terminals for all control terminations.



VCP-W Portable Lifter



Dockable Dolly, Roll-in-off-the-floor Ramp, and Ground & Test Devices



Cutler-Hammer's Medium Voltage Vacuum Circuit Breaker Family

Back Row: 5/15 kV VCP-WR Series 29, 5 kV VCP-WR Series 20, 5 kV DHP-VR, 15 kV DHP-VR, 36 kV W-VAC, 3.6-17.5 kV W-VAC, 36 kV VCP-W, 15.5 kV VCP-W Outdoor  
Front Row: 5/15 kV VCP-WR Series 18, 5/15 kV VCP-SE, 27 kV VCP-W, 5/15 kV VCP-W, 5 kV VCPW-ND



# Westinghouse Medium Voltage Vacuum Circuit Breakers

Vacuum Circuit Breakers  
designed to meet or exceed  
both ANSI and IEC Standards

## ANSI Standards – VCP-W or VCPW-SE Vacuum Circuit Breaker Types Rated on Symmetrical Current Rating Basis ①

Identification			Rated Values											Weight	
Circuit Breaker Type	Nominal Voltage Class	Nominal 3-Phase MVA Class	Voltage		Insulation Level		Current		Interrupting Time	Permissible Tripping Delay	Maximum Voltage Divided By K	Current Values			
			Maximum Voltage	Voltage Range Factor	Withstand Test Voltage		Continuous Current at 60 Hz	Short Circuit Current (at Rated Max. kV)				Maximum Symmetrical Interrupting Capability	Closing and Latching Capability	Closing and Latching Capability Momentary	
E	K			Power Frequency (1 min.)	Impulse						K Times Rated Short Circuit Current ②③	2.7 K Times Rated Short Circuit Current	1.6 K Times Rated Short Circuit Current		
kV	MVA	kV rms	kV	kV rms	kV Peak	Amperes	kA rms	Cycles	Seconds	E/K	kA rms	kA Peak	kA rms	lbs.	
50VCP-W250	4.16	250	4.76	1.24	19	60	1200 2000 3000	29	5	2	3.85	36	97 132	58 78	350 410 525
50VCP-W350	4.16	350	4.76	1.19	19	60	1200 2000 3000	41	5	2	4.0	49	132	78	460 490 525
75VCP-W500	7.2	500	8.25	1.25	36	95	1200 2000 3000	33	5	2	6.6	41	111	66	375 410 525
150VCP-W500	13.8	500	15	1.30	36	95	1200 2000 3000	18	5	2	11.5	23	62 97②	37 58②	350 410 525
150VCP-W750	13.8	750	15	1.30	36	95	1200 2000 3000	28	5	2	11.5	36	97 130②	58 77②	350 410 525
150VCP-W1000	13.8	1000	15	1.30	36	95	1200 2000 3000	37	5	2	11.5	48	130	77	460 490 525
150VCP-W1500	13.8	1500	15	1.00	36	95	1200 2000 3000	63	5	2	15.0	63	170	101	460 490 525

## IEC Standards – VCP-W or VCPW-SE Vacuum Circuit Breaker Types Rated on Symmetrical Current Rating Basis

Identification		Rated Values							Weight	
Circuit Breaker Type	Voltage Class	Insulation Level		Normal Current	Short Circuit Breaking Current	3 Second Short Time Current	Short Circuit Making Current	Cable Charging Breaking Amps		
		Power Frequency	Impulse Withstand							
		kV rms	kV Peak	Ampere	kA rms	kA rms	kA Peak	Ampere	kg	
36VCP-W25	3.6	10	40	630, 1250, 2000	25	25	63	25	188	
36VCP-W32	3.6	10	40	1250, 2000	31.5	31.5	79	25	188	
36VCP-W40	3.6	10	40	1250, 2000	40	40	100	25	225	
72VCP-W25	7.2	20	60	630, 1250, 2000	25	25	63	25	188	
72VCP-W32	7.2	20	60	1250, 2000	31.5	31.5	79	25	188	
72VCP-W40	7.2	20	60	1250, 2000	40	40	100	25	225	
120VCP-W25	12.0	28	75	630, 1250, 2000	25	25	63	25	195	
120VCP-W32	12.0	28	75	1250, 2000	31.5	31.5	79	25	195	
120VCP-W40	12.0	28	75	1250, 2000	40	40	100	25	225	
175VCP-W25	17.5	38	95	1250, 2000	25	25	63	31.5	195	
175VCP-W32	17.5	38	95	1250, 2000	31.5	31.5	79	31.5	195	
175VCP-W40	17.5	38	95	1250, 2000	40	40	100	31.5	225	

① Applicable ANSI Standards C37.04-1979, C37.09-1979, and C37.06-1987.  
Operating Duty Cycle CO-15 seconds-CO. Operating Time Values:  
Opening 30-45 ms, Closing 45-60 ms and reclosing 18 cycles (300 ms).  
② Consult Application Data 32-266 for further information.

③ Optional interrupting time of 3 cycles is available.  
④ Also 3-second short time current carrying capability.  
⑤ Interrupting time is 3 cycles at 50/60 Hz.  
Rated operating sequence O-3 min-CO-3 min-CO, in accordance with IEC-66.



Typical Specification for  
Westinghouse Type VCP-W or VCPW-SE  
Medium Voltage Vacuum Circuit Breakers  
and Related Metal-Clad Switchgear

All circuit breakers and related switchgear shall conform to applicable [ANSI, IEEE, UL Listed] or [IEC] ① standards. All circuit breakers shall use vacuum interrupter technology, be manufactured in a Cutler-Hammer ISO 9002 factory, and be Westinghouse Type VCP-W② or Type VCPW-SE②, rated as follows:

Maximum Voltage:

ANSI 4.76 kV - 15 kV  
IEC 3.6 - 17.5 kV

Insulation Level:

Power Frequency - [19 kV rms] - [36 kV rms]③  
Impulse Withstand - [60 kV] - [95 kV] peak③

Short Circuit Current:

ANSI - 250, 350, 500, 750, 1000, or 1500MVA③  
IEC - [25 kA], [31.5 kA] or [40 kA]③

Close and Latch Capability:

ANSI - [97 kA], [132 kA], [111 kA], [62 kA],  
[130 kA], or [170 kA] peak③

Short Circuit Making Current:

IEC - [63 kA], [79 kA], or [100kA] peak③

Interrupting Time:

[Five] or [Three] cycles③

Continuous Current:

ANSI - [1200A], [2000A] or [3000A]③  
IEC - [630A], [1250A] or [2000A]③

The vacuum circuit breakers shall be horizontal drawout type capable of being withdrawn on rails. The circuit breakers shall be operated by a motor charged spring type stored energy mechanism, charged normally by an electric motor and in an emergency by a manual charging tool. The primary disconnecting contacts shall be self-aligning, silverplated copper. Each circuit breaker shall be of modular construction, containing front accessible mechanism with free and unobstructed access to control components for ease of inspection or maintenance. Each circuit breaker shall contain three vacuum interrupters separately mounted in a self-contained, self-aligning pole unit, which can be removed as complete assemblies. The vacuum interrupter pole unit primary phase to ground insulation system shall be [glass polyester]③ or [Cycloaliphatic Epoxy]③. A contact erosion indicator for each vacuum interrupter, which requires no special tools to indicate available contact life, shall be easily visible when the breaker is removed from its

compartment. The vacuum interrupter shall utilize copper chrome contact material. The current transfer from the vacuum interrupter moving stem to the breaker main conductor shall be a nonsliding/nonrolling design. The secondary contacts shall be silver-plated and shall automatically engage the breaker in the operating position, and also manually engage in test position.

Each circuit breaker compartment cell shall be equipped to house a removable breaker element. The levering device shall allow for the circuit breaker to be connected or disconnected with the door closed by use of a manual levering tool or optionally by an electrical levering mechanism. It will include all of the necessary interlocks to render the breaker mechanism mechanically and electrically trip free during the levering process. Extension rails shall be provided to allow withdrawal of the circuit breaker for inspection and maintenance without the need for lifting devices or portable platforms.

The stationary primary contacts shall be silver-plated and recessed within [glass polyester] or [porcelain]③ insulating tubes. A grounded steel shutter shall automatically cover the stationary primary disconnecting contacts when the circuit breaker is in the test or disconnected position or out of the cell. Positive guidance rails shall be provided to automatically align the primary and secondary disconnects while inserting the circuit breaker into the switchgear.

All main bus supports between sections shall be [glass polyester] or [porcelain]③. All auxiliary compartments for potential transformers, control power transformers, and/or fuse drawers shall conform to a drawout switchgear construction. Main bus supports, cable supports, and all standoff insulators shall be glass polyester or porcelain.

The switchgear assembly shall consist of individual vertical sections housing various combinations of circuit breakers and auxiliaries, bolted to form a rigid metal-clad 36" wide switchgear assembly.

Note to Specification Writer:

- ① Select one of the available standards or ratings.
- ② Select for Type VCP-W Vacuum Circuit Breaker
- ③ Select for harsh environmental conditions - Type VCPW-SE

## Cutler-Hammer

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