

VD4

Vacuum circuit-breaker



ABB Power Distribution







VD4

Vacuum circuit-breaker

12 kV, ...4000 A, ...63 kA

17.5 kV, ...4000 A, ...40 kA

24 kV, ...2500 A, ...31.5 kA

- Depending on rating
 - up to 30 000 mechanical operating cycles,
 - up to 20 000 breaking operations at rated current,
 - up to 100 breaking operations at rated short-circuit breaking current are permissible.

Verdict: **The VD4 circuit-breaker can exceed your requirements!**

- Ideally suited to switching resistive, capacitive and inductive loads.

Verdict: **The VD4 is a very versatile circuit-breaker!**

- Maintenance? Occasional cleaning and lubrication of the operating mechanism are all that is normally required.

Verdict: **The VD4 circuit-breaker is low on maintenance!**

- Especially climate resistant with its vertical insulation surfaces, and suitable for extreme environmental conditions.

- Complies with VDE 0670 and IEC publication 60056 and the standards of leading industrialized nations.

Verdict: **The VD4 circuit-breaker can be used worldwide.**



Vacuum circuit-breaker type VD4 with cutaway mechanism enclosure and pole tubes

**Vacuum circuit-breakers:
Top level technology**

Vacuum circuit-breakers occupy a leading position among breaker types.

Contacts in a vacuum do not oxidize and thus retain a consistently low contact resistance. The low erosion ensures a long contact life. Both lead to the interrupters being maintenance-free throughout the service life of the breaker.

Vacuum interrupters are self-regenerating.

As the metal vapour created during the switching operation binds gas molecules in the interrupter chamber and removes them from the gas space during condensation, the pressure in the interrupter chamber drops and its service life is prolonged.

Vacuum circuit-breakers are unbeaten in in-service availability.

Because the contact speed, travel and mass in the interrupters are reduced, low spring forces are sufficient for operation. The breaker operating mechanism is thus extremely low in wear, and the maintenance requirement accordingly negligible.

VD4: Optimum interrupters fitted

All VD4 circuit-breakers are exclusively fitted with interrupters from our own production. As the interrupters and operating mechanisms come from under one roof, they can be optimally matched for the VD4.

VD4: Pole tubes protect against physical and electrical damage

The interrupters are installed in vertically mounted tubular insulators.

This provides effective protection for the high quality interrupters against external damage. Impact stresses on the poles first affect the insulators, to which any damage can then easily be seen.

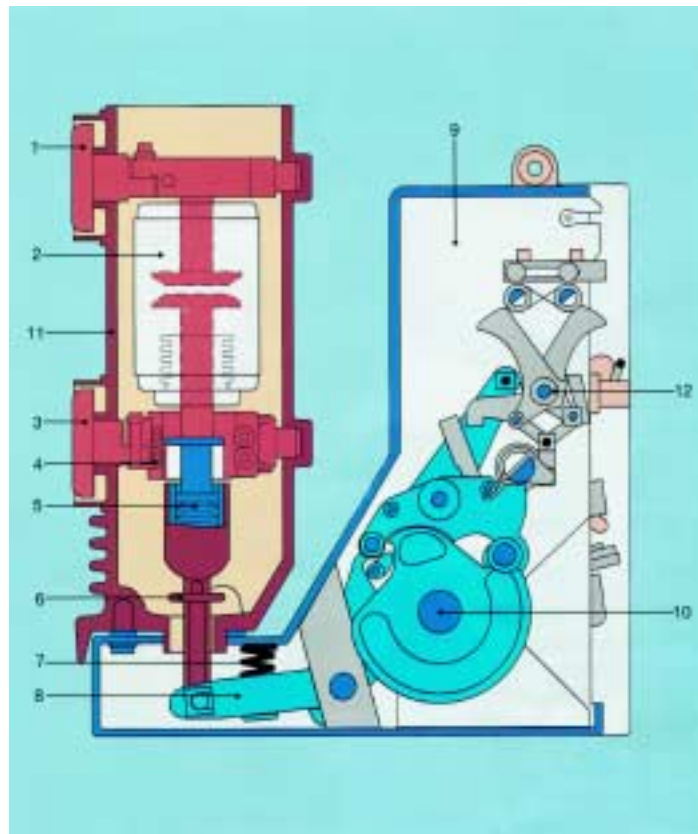
The tubular insulators cause an optimum distribution of the electrical field with regard to voltage stresses, and also allow small pole-centre distances. The vertical arrangement of the insulators largely prevents dust deposits over the insulation distances.

The pole tubes are manufactured from cast epoxy resin, which is particularly resistant to tracking.

This breaker design ensures a high resistance to voltage stresses even in tropical and heavily contaminated environments.

VD4: Only one mechanism

Ideal matching of the VD4 circuit-breaker with its power requirement, has been achieved by precisely controlled force transmission.



Section of a circuit-breaker for 12 kV, 1250 A, 31.5 kA

- 1 Upper connection
- 2 Vacuum interrupter
- 3 Lower connection
- 4 Roller contact
- 5 Contact pressure spring (swivel contact for 630 A)
- 6 Insulated coupling rod
- 7 Opening spring
- 8 Shift lever
- 9 Mechanism housing with spring operating mechanism
- 10 Drive shaft
- 11 Pole tube
- 12 Release mechanism

This has made it possible to have only one type of operating mechanism for all the VD4 variants.

Apart from simplifying the stocking of spare parts, the use of the same operating mechanism also has the great advantage that even circuit-breakers manufactured relatively seldom, e.g. those with high rated currents or short-circuit breaking currents, have a tried and tested mechanism of which many thousands are in service.

The stored energy spring mechanism is always fitted with a manual charging facility, and optionally with a charging motor in addition.

The circuit-breakers are suitable for autoreclosing without any additional equipment, and also for multi-shot autoreclosing when charging motors are fitted.

VD4: For every field of application

Vacuum circuit-breakers of type VD4 are ideally suitable for switching:

- Short-circuit currents,
- Cables and overhead lines under load and no-load conditions,
- Transformers and generators under load and no-load conditions,
- Ripple control systems,
- Capacitor banks (including parallel switching) and motors.

Their compact design guarantees a wide range of applications, from service in high quality metal-clad switchgear panels with withdrawable circuit-breakers to the replacement of obsolete breakers in existing switchgears.

For this purpose, a withdrawable module frame is available to convert switchgears to those with withdrawable equipment in the simplest possible manner. The frame contains not only the interlock facilities but also the fixed mounted contacts with their shutters in front.

For service in electrical power distribution networks, there is the circuit-breaker variant VD4 E. This type is equal in reliability to the basic VD4 version: the rated current and rated short-circuit breaking current have however been adapted to suit the requirements of distribution networks.

VD4: Complete equipment

Circuit-breaker with manual charging mechanism

Always installed:

- Mechanical pushbutton for opening and closing,
- Indicators for breaker position and charging condition of the mechanism spring,
- Switching operations counter,
- Shunt release OFF,
- Auxiliary switches for release, position and fault signalling.

Circuit-breaker with motorized charging mechanisms

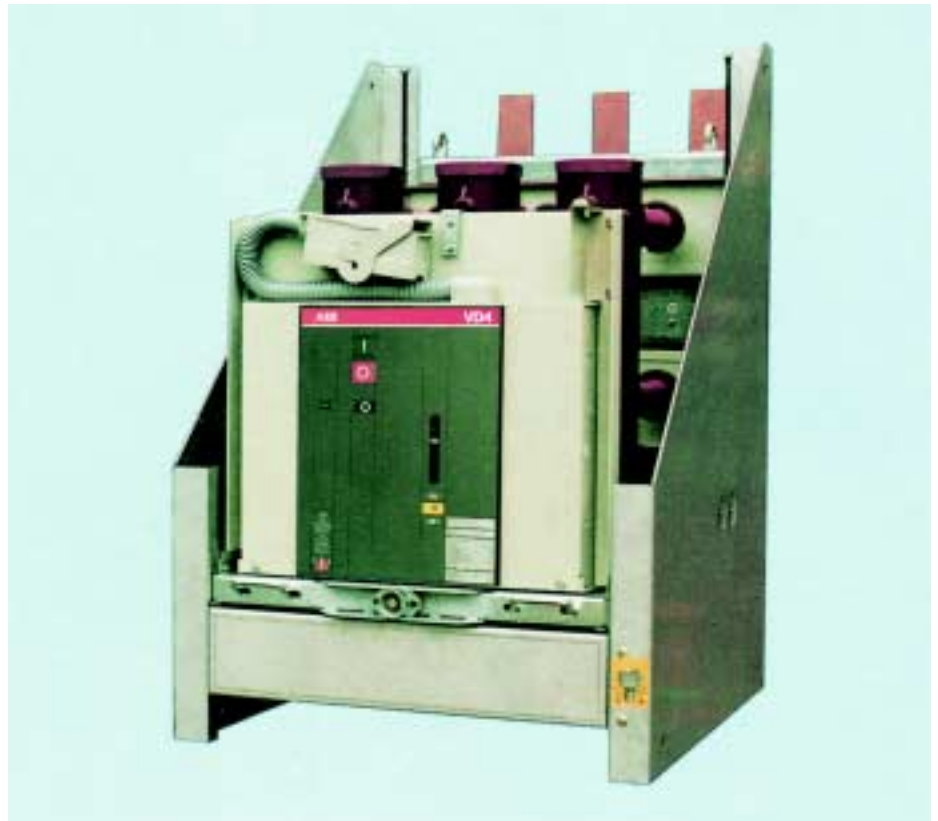
Additionally installed:

- Electricmotor,
- Shunt release ON,
- Anti-pump relay,
- Auxiliary switches for charging motor and releases.

Further accessories

Depending on the switching function:

- Blocking magnet,
- Undervoltage release, delayed or undelayed,
- Indirect overcurrent release,
- Further auxiliary switches for control, interlocking and signalling purposes.



Mounting frame with VD4 withdrawable module and shutters



VD4 circuit-breaker on withdrawable module



View into the mechanism housing, cover removed

VD4: Top quality

The bedrock on which the high quality of VD4 vacuum circuit-breakers rests was already created in the development phase by type testing in the company's own high power test bay. Today, applying the findings of these tests, and with modern manufacturing methods and the use of materials of the highest grades, a quality product is manufactured. In order to ensure that the quality of VD4 circuit-

breakers complies with the relevant specifications, all sectors from development via material procurement to production are interlinked with a powerful quality assurance system to DIN EN ISO 9001.

We believe there is no alternative to VD4 vacuum circuit-breakers.

Vacuum circuit-breaker

Rated ²⁾ voltage kV	Rated current A	Rated short- circuit breaking current symm ¹⁾ kA	Short-circuit breaking current asymm ¹⁾ kA	Rated short- circuit making current ¹⁾ kA	Rated short-circuit duration s	Pole centres mm	Dimensions			
							Height mm	Depth mm	Width mm	
12	630 ³⁾	16	17.4	40	3	150; 210	472	459	450; 570	
		20	21.8	50	3	150; 210	472	459	450; 570	
		25	27.3	63	3	150; 210	472	459	450; 570	
	630	16	17.4	40	3	150; 210	475	424	450; 570	
		20	21.8	50	3	150; 210	475	424	450; 570	
		25	27.3	63	3	150; 210	475	424	450; 570	
	1250	16	17.4	40	3	150; 210	545	424	450; 570	
		20	21.8	50	3	150; 210	475	424	450; 570	
		25	27.3	63	3	150; 210	475	424	450; 570	
	1250	31.5	34.3	80	3	150; 210	545	424	450; 570	
		40	43.6	100	3	210	545	424	570	
		40	43.6	125	3	210	613	459	610	
	1600	25	27.3	63	3	210; 275	613	459	610; 750	
		31.5	34.3	85	3	275	613	459	750	
		40	43.6	100 ⁴⁾	3	210; 275	613	459	610; 750	
	2000	25	27.3	63	3	210; 275	613	459	610; 750	
		31.5	34.3	85	3	210; 275	613	459	610; 750	
		40	43.6	100 ⁴⁾	3	210; 275	613	459	610; 750	
	2500	25	27.3	63	3	210; 275	613	459	610; 750	
		31.5	34.3	85	3	275	613	459	750	
		40	43.6	100 ⁴⁾	3	210; 275	613	459	610; 750	
	3150	25	27.3	63	3	275	613	459	750	
		31.5	34.3	85	3	275	673	459	750	
		40	43.6	100 ⁴⁾	3	275	673	459	750	
	4000 ⁵⁾	25	27.3	63	3	275	673	459	750	
		31.5	34.3	85	3	275	673	459	750	
		40	43.6	100 ⁴⁾	3	275	673	459	750	
	17.5	630 ³⁾	16	17.4	40	3	150 ⁶⁾ ; 210	472	459	450 ⁶⁾ ; 570
			20	21.8	50	3	150 ⁶⁾ ; 210	472	459	450 ⁶⁾ ; 570
			25	27.3	63	3	150; 210	475	424	450; 570
		630	16	17.4	40	3	150; 210	475	424	450; 570
			20	21.8	50	3	150; 210	475	424	450; 570
			25	27.3	63	3	150; 210	475	424	450; 570
		1250	16	17.4	40	3	150; 210	545	424	450; 570
			20	21.8	50	3	150; 210	475	424	450; 570
			25	27.3	63	3	150; 210	475	424	450; 570
		1250	31.5	34.3	80	3	150; 210	545	424	450; 570
			40	43.6	100 ⁴⁾	3	210	613	459	610
			40	43.6	125	3	210; 275	613	459	610; 750
		1600	25	27.3	63	3	210; 275	613	459	610; 750
			31.5	34.3	80	3	275	613	459	750
			40	43.6	100 ⁴⁾	3	210; 275	613	459	610; 750
		2000	25	27.3	63	3	210; 275	613	459	610; 750
			31.5	34.3	80	3	275	613	459	750
			40	43.6	100 ⁴⁾	3	210; 275	613	459	610; 750
		2500	25	27.3	63	3	210; 275	613	459	610; 750
			31.5	34.3	80	3	275	613	459	750
			40	43.6	100 ⁴⁾	3	210; 275	613	459	610; 750
3150		25	27.3	63	3	275	613	459	750	
		31.5	34.3	80	3	275	673	459	750	
		40	43.6	100 ⁴⁾	3	275	673	459	750	
4000 ⁵⁾		25	27.3	63	3	275	673	459	750	
		31.5	34.3	80	3	275	673	459	750	
		40	43.6	100 ⁴⁾	3	275	673	459	750	
24		630 ³⁾	16	17.4	40	3	210; 275	643	459	570; 700
			20	21.8	50	3	210; 275	660	424	570; 700
			25	27.3	63	3	210; 275	660	424	570; 700
		630	16	17.4	40	3	210; 275	660	424	570; 700
			20	21.8	50	3	210; 275	660	424	570; 700
			25	27.3	63	3	210; 275	660	424	570; 700
		1250	16	17.4	40	3	210; 275	660	424	570; 700
			20	21.8	50	3	210; 275	660	424	570; 700
			25	27.3	63	3	210; 275	660	424	570; 700
		1250	31.5	34.3	80	3	210; 275	660	424	570; 700
			40	43.6	100 ⁴⁾	3	210; 275	660	424	570; 700
			40	43.6	125	3	210; 275	660	424	570; 700
		1600	16	17.4	40	3	275	748	459	760
			20	21.8	50	3	275	748	459	760
			25	27.3	63	3	275	748	459	760
		1600	31.5	34.3	80	3	275	748	459	760
			40	43.6	100 ⁴⁾	3	275	748	459	760
			40	43.6	125	3	275	748	459	760
		2000	16	17.4	40	3	275	748	459	760
			20	21.8	50	3	275	748	459	760
			25	27.3	63	3	275	748	459	760
	2000	31.5	34.3	80	3	275	748	459	760	
		40	43.6	100 ⁴⁾	3	275	748	459	760	
		40	43.6	125	3	275	748	459	760	
	2500	16	17.4	40	3	275	748	459	760	
		20	21.8	50	3	275	748	459	760	
		25	27.3	63	3	275	748	459	760	
	2500	31.5	34.3	80	3	275	748	459	760	
		40	43.6	100 ⁴⁾	3	275	748	459	760	
		40	43.6	125	3	275	748	459	760	

Mounting frame

12	...2500	...31.5	150	1000	692	644
17.5	...2500	...31.5	210	1000	692	644; 794
24	...1250	...31.5	275	1200	840	794; 994

- 1) When the operating voltage is less than the rated voltage, the same values as for rated voltage always apply. Higher values in individual cases on request.
 2) Test voltages to VDE 0670, Part 1000, List 2 3) Type: VD4 E 4) 125 kA possible 5) Circuit-breaker with force cooling 6) For VD4 E on withdrawable module only

Details of the VD4 vacuum circuit-breakers can be found in the VD4 handbook.



ABB Calor Emag Mittelspannung GmbH

Oberhausener Strasse 33 Petzower Strasse 8
D-40472 Ratingen D-14542 Glindow
Phone: +49(0)21 02/12-12 30, Fax: +49(0)21 02/12-19 16
E-Mail: calor.info@de.abb.com
Internet: <http://www.abb.de/calor>

ABB Sace T.M.S. S.p.A

Via Friuli, 4
I-24044 Dalmine
Phone: +39 035/395111, Fax: +39/035 395874
E-mail: sacetms.tipm@it.abb.com
Internet: <http://www.abb.com>