

.													
17.5													
17.5													
38													
95													
50-60													
1600	1600	1600	1600	1600	1600	2000	2000	2000	2000	2500	2500	3150 (°)	3150 (°)
-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	20	-	-	-	-	20	20	-	-	20	-	20	-
25	25	-	-	-	-	25	25	-	-	25	-	25	-
31.5	31.5	-	-	-	-	31.5	31.5	-	-	31.5	-	31.5	-
-	-	40	40	-	-	40	40	-	-	40	-	40	-
-	-	-	-	50	50	-	-	50	50	-	50	-	50
-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	20	-	-	-	-	20	20	-	-	20	-	20	-
25	25	-	-	-	-	25	25	-	-	25	-	25	-
31.5	31.5	-	-	-	-	31.5	31.5	-	-	31.5	-	31.5	-
-	-	40	40	-	-	40	40	-	-	40	-	40	-
-	-	-	-	50	50	-	-	50	50	-	50	-	50
-	-	-	-	-	-	-	-	-	-	-	-	-	-
50	50	-	-	-	-	50	50	-	-	50	-	50	-
63	63	-	-	-	-	63	63	-	-	63	-	63	-
80	80	-	-	-	-	80	80	-	-	80	-	80	-
-	-	100	100	-	-	100	100	-	-	100	-	100	-
-	-	-	-	125	125	-	-	125	125	-	125	-	125
.													
33 ... 60													
10 ... 15													
43 ... 75													
30 ... 60													
599	599	589	589	610	610	599	599	610	610	599	610	635	636
570	700	570	700	600	750	570	700	600	750	700	750	700	750
424	424	424	424	459	459	424	424	459	459	424	459	424	459
210	275	210	275	210	275	210	275	210	275	275	275	275	275
98	105	84	84	146	158	98	105	146	158	105	163	140	177
7407 (!)	7408 (!)	-	-	-	-	7407 (!)	7408 (!)	-	-	7408 (!)	-	-	-
-	-	003282 (!)	003285 (!)	003440	003441	-	-	003440	003441	-	003441	-	-
- 5 ... + 40													
.													
.													

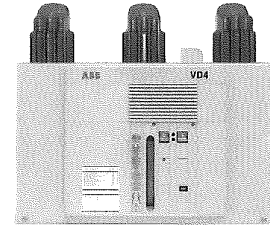
На основании чл.36а
ал.3 от ЗОП

27.04.22

Selection and ordering

Fixed circuit breakers

VD4 fixed circuit breaker (24 kV) (?)



Circuit breaker		VD4 24						
Standards	IEC 62271-100	•						
Rated voltage	Ur [kV]	24						
Rated insulation voltage	Us [kV]	24						
Withstand voltage at 50 Hz	Ud (1 min) [kV]	50						
Impulse withstand voltage	Up [kV]	125						
Rated frequency	fr [Hz]	50-60						
Rated thermal current (40 °C)	Ir [A]	630	630	1250	1250	1600	2000	2500
		16	16	16	16	16	16	-
Rated breaking capacity (rated symmetrical short-circuit current)	Isc [kA]	20	20	20	20	20	20	-
		25	25	25	25	25	25	25
		-	-	31.5	-	31.5	31.5	31.5
Admissible rated short-time withstand current (3s)	Ik [kA]	16	16	16	16	16	16	-
		20	20	20	20	20	20	-
		25	25	25	25	25	25	25
Making capacity	Ip [kA]	-	-	31.5	-	31.5	31.5	31.5
		40	40	40	40	40	40	-
		50	50	50	50	50	50	-
		63	63	63	63	63	63	63
		-	-	80	-	80	80	80
Operation sequence	[O - 0.3 s - CO - 15 s - CO]	•						
Opening time	[ms]	33 ... 60						
Arcing time	[ms]	10 ... 15						
Total breaking time	[ms]	43 ... 75						
Closing time	[ms]	30 ... 60						
Maximum overall dimensions	H [mm]	631	631	631	631	642	642	642
	W [mm]	570	700	570	700	700	700	700
	D [mm]	424	424	424	424	424	424	424
	Pole center distance P [mm]	210	275	210	275	275	275	275
Weight	[kg]	100	104	100/106 (1)	104	110	110	110
Standardized table of dimensions	TN	7409	7410	7409	7410	7411	7411	7411
	1VCD	-	-	000172 (1)	-	-	-	-
Operating temperature	[°C]	- 5 ... + 40						
Tropicalization	IEC: 60068-2-30, 60721-2-1	•						
Electromagnetic compatibility	IEC: 62271-1	•						

(1) 31.5 kA version

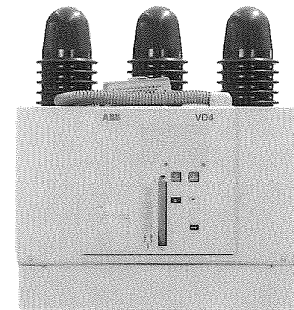
(2) On request, the closing spring can be loaded by means of a removable crank handle outside operating mechanism (instead of linear loading by a lever built operating mechanism)

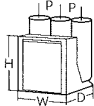
На основании чл.36а
ал.3 от ЗОП

000003

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VD4 fixed circuit breaker (36 kV)



Circuit breaker		VD4 36				
Standards	IEC 62271-100 •					
Rated voltage	Ur [kV]	36				
Rated insulation voltage	Us [kV]	36				
Withstand voltage at 50 Hz	Ud (1 min) [kV]	70				
Impulse withstand voltage	Up [kV]	170				
Rated frequency	fr [Hz]	50				
Rated thermal current (40 °C)	Ir [A]	1250	1600	2000	2500	
		20	20	20	20	
Rated breaking capacity (rated symmetrical short-circuit current)	Isc [kA]	25	25	25	25	
		31.5	31.5	31.5	31.5	
Admissible rated short-time withstand current (3s)	Ik [kA]	20	20	20	20	
		25	25	25	25	
Making capacity	Ip [kA]	31.5	31.5	31.5	31.5	
		50	50	50	50	
Operation sequence	[O - 0.3 s - CO - 15 s - CO] •	63	63	63	63	
		80	80	80	80	
Opening time	[ms]	35 ... 60				
Arcing time	[ms]	10 ... 15				
Total breaking time	[ms]	45 ... 75				
Closing time	[ms]	50 ... 65				
Maximum overall dimensions		H [mm]	884	884	884	884
		W [mm]	796	796	796	796
		D [mm]	501	501	501	501
		Pole center distance P [mm]	275	275	275	275
Weight	[kg]	170	170	170	210	
Standardized dimensions table	TN	1VYN300901-RF	1VYN300901-RF	1VYN300901-RF	1VYN300901-RF	
Operating temperature	[°C]	- 5 ... + 40				
Tropicalization	IEC: 60068-2-30, 60721-2-1 •					
Electromagnetic compatibility	IEC: 62271-1 •					

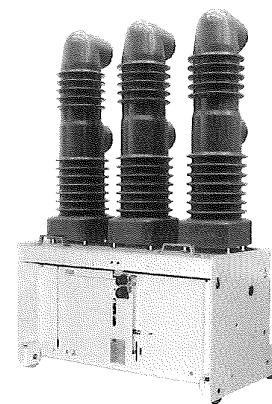
На основании чл.36а
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000053

Selection and ordering

Fixed circuit breakers

VD4 fixed circuit breaker in floor rolling version (36 kV)



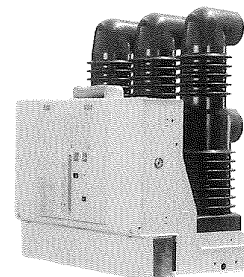
Circuit breaker		VD4 36				
Standards	IEC 62271-100 •					
Rated voltage	Ur [kV]	36				
Rated insulation voltage	Us [kV]	36				
Withstand voltage at 50 Hz	Ud (1 min) [kV]	95				
Impulse withstand voltage	Up [kV]	185				
Rated frequency	fr [Hz]	50-60				
Rated thermal current (40 °C)	Ir [A]	630	1250	1600	2000	2500
		16	16	-	-	-
Rated breaking capacity (rated symmetrical short-circuit current)	Isc [kA]	20	25	-	-	-
		-	25	25	25	25
		-	31.5	31.5	31.5	31.5
		-	40	40	40	40
Admissible rated short-time withstand current (3s)	Ik [kA]	16	16	-	-	-
		20	25	-	-	-
		-	25	25	25	25
		-	31.5	31.5	31.5	31.5
Making capacity	Ip [kA]	-	40	40	40	40
		-	50	-	-	-
		-	63	63	63	63
		-	80	80	80	80
Operation sequence	[O - 0.3 s - CO - 15 s - CO]	IEC: 62271-1•				
		• • •				
Opening time	[ms]	≤45				
Arcing time	[ms]	≤15				
Total breaking time	[ms]	≤60				
Closing time	[ms]	approx. 60				
Maximum overall dimensions		H [mm]	1575	1575	1575	1575
		W [mm]	1000	1000	1000	1000
		D [mm]	555	555	555	555
		Pole distance P [mm]	360	360	360	360
Weight	[kg]	320	320	320	355	355
Standardized dimensions table	TN GCEM 700198					
Operating temperature	[°C]	- 5 ... + 40				
Tropicalization	IEC: 60068-2-30, 60721-2-1 •					
Electromagnetic compatibility	IEC: 62271-1 •					

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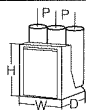
000002

18

VD4 fixed circuit breaker (38 kV) - IEEE C37.09 Standards



Circuit breaker	VD4 38	
Standards	IEEE C37.09	•
Rated voltage	Ur [kV]	38
Rated insulation voltage	Us [kV]	38
Withstand voltage at 50 Hz	Ud (1 min) [kV]	80
Impulse withstand voltage	Up [kV]	150
Rated frequency	fr [Hz]	60
Rated thermal current (40 °C)	Ir [A]	1200
Rated breaking capacity (rated symmetrical short-circuit current)	Isc [kA]	31.5
Rated short-time withstand current (3s)	I _{tk} [kA]	31.5
Making capacity	I _p [kA]	82
Operation sequence	[O - 0.3 s - CO - 3 min - CO]	•
Opening time	[ms]	30 ... 35
Arcing time	[ms]	5 ... 15
Total breaking time	[ms]	35 ... 50 3-cycle
Closing time	[ms]	50 ... 65
Maximum overall dimensions	H [mm]	884
	W [mm]	796
	D [mm]	501
	Pole center distance P [mm]	275
Weight	[kg]	170
Standardized dimensions table	TN 1VYN300901-RF	1VYN300901-RF
Operating temperature	[°C]	- 5 ... + 40
Tropicalization	IEC: 60068-2-30, 60721-2-1	•
Electromagnetic compatibility	IEC 62271-1	•



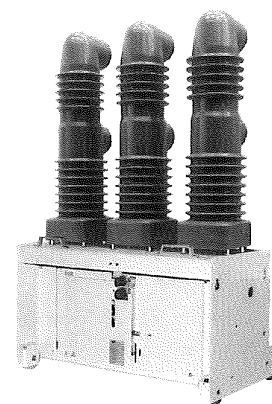
На основании чл.36а
ал.3 от ЗОП

000002

Selection and ordering

Fixed circuit breakers

VD4 fixed circuit breaker in floor rolling version (40 kV)



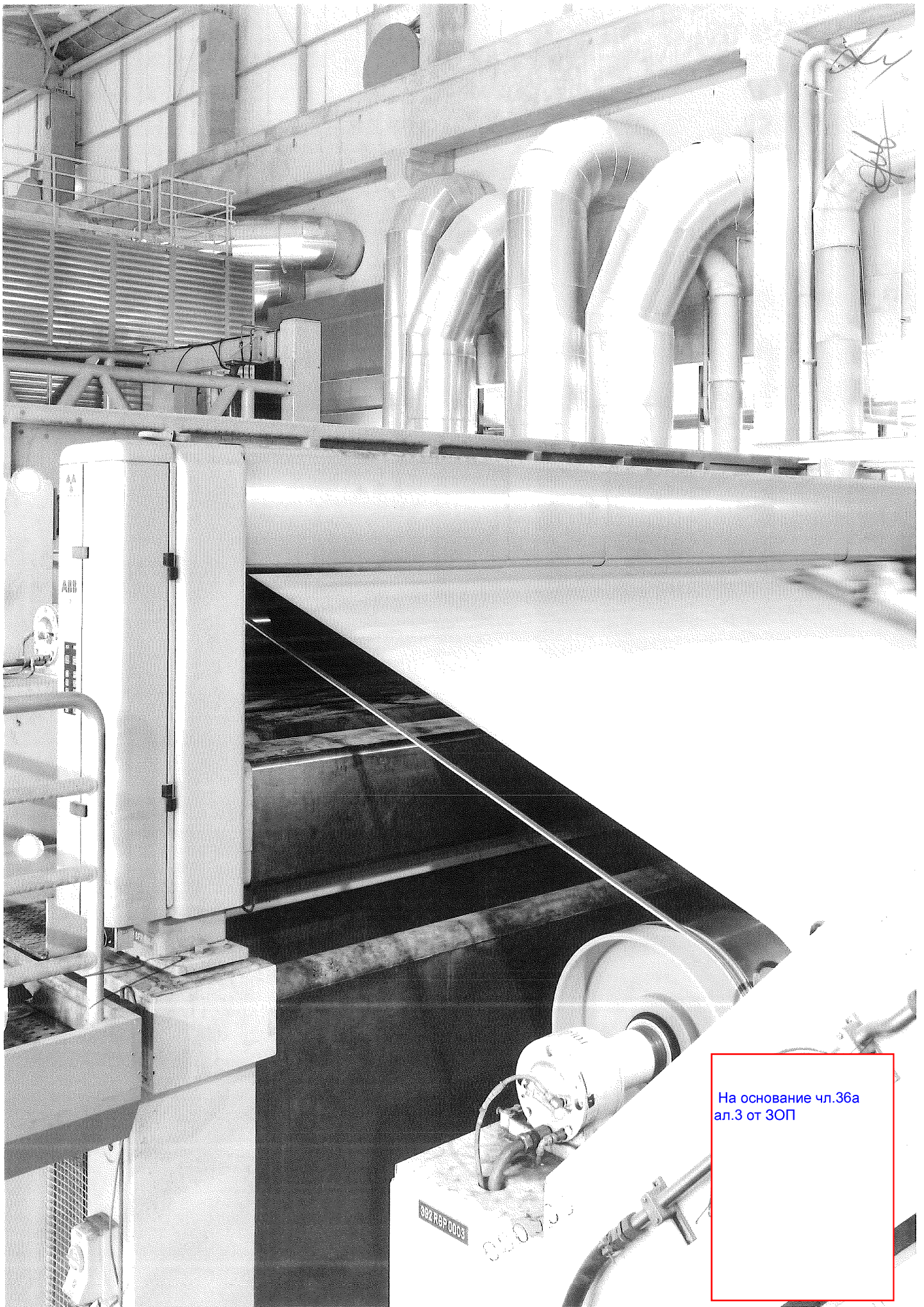
Circuit breaker		VD4 40 (1)				
Standards	IEC 62271-100 *					
Rated voltage	Ur [kV]	40.5				
Rated insulation voltage	Us [kV]	40.5				
Withstand voltage at 50 Hz	Ud (1 min) [kV]	95				
Impulse withstand voltage	Up [kV]	185-200				
Rated frequency	fr [Hz]	50-60				
Rated thermal current (40 °C)	Ir [A]	630	1250	1600	2000	2500 (2)
		16	16	-	-	-
Rated breaking capacity (rated symmetrical short-circuit current)	Isc [kA]	20	20	-	-	-
		-	25	25	25	25
		-	31.5	31.5 (2)	31.5 (2)	31.5 (2)
		-	40	40	40	40
Admissible rated short-time withstand current (3s)	Ik [kA]	16	16	-	-	-
		20	20	-	-	-
		-	25	25	25	25
		-	31.5	31.5	31.5	31.5
Making capacity	Ip [kA]	40	40	-	-	-
		50	50	-	-	-
		-	63	63	63	63
		-	80	80	80	80
Operation sequence	[O - 0.3 s - CO - 15 s - CO] *	-	100	100	100	100
		-	100	100	100	100
		-	100	100	100	100
		-	100	100	100	100
Opening time	[ms]	≤45				
Arcing time	[ms]	≤15				
Total breaking time	[ms]	≤60				
Closing time	[ms]	approx. 60				
Maximum overall dimensions	H [mm]	1575	1575	1575	1575	1575
	W [mm]	1000	1000	1000	1000	1000
	D [mm]	555	555	555	555	555
	Pole center distance P [mm]	360	360	360	360	360
Weight	[kg]	320	320	290	340	340
Standardized dimensions table	TN	GCEM 700198				
Operating temperature	[°C]	- 5 ... + 40				
Tropicalization	IEC: 60068-2-30, 60721-2-1 *					
Electromagnetic compatibility	IEC: 62271-1 *					

(1) GOST version available on request.

(2) Version for capacity banks available on request.

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На основании чл.36а
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Selection and ordering

Fixed circuit breakers

Types of fixed circuit breakers available

Complete the circuit breaker selected with the optional accessories indicated on the following pages.

VD4 fixed circuit breaker without bottom and top terminals (12 kV)

Ur	Isc	Rated thermal current (40°C) [A]										Circuit breaker type	
		H=461		H=589		H=599		H=610		H=636			
kV	kA	D=424		D=424		D=424		D=459		D=459			
		u/l=205		u/l=310		u/l=310		u/l=310		u/l=310			
		l/g=217.5		l/g=238		l/g=237.5		l/g=237		l/g=237			
		P=150	P=210	P=275	P=210	P=275	P=150	P=210	P=275	P=210	P=275	P=275	
		W=450	W=570	W=700	W=570	W=700	W=450	W=570	W=700	W=600	W=750	W=750	
16	630											VD4 12.06.16 p150	
20	630											VD4 12.06.20 p150	
25	630											VD4 12.06.25 p150	
31.5	630											VD4 12.06.32 p150	
16	1250											VD4 12.12.16 p150	
20	1250											VD4 12.12.20 p150	
25	1250											VD4 12.12.25 p150	
31.5	1250											VD4 12.12.32 p150	
20							1600					VD4 12.16.20 p150	
25							1600					VD4 12.16.25 p150	
31.5							1600					VD4 12.16.32 p150	
16	630											VD4 12.06.16 p210	
20	630											VD4 12.06.20 p210	
25	630											VD4 12.06.25 p210	
31.5	630											VD4 12.06.32 p210	
16	1250											VD4 12.12.16 p210	
20	1250											VD4 12.12.20 p210	
25	1250											VD4 12.12.25 p210	
31.5	1250											VD4 12.12.32 p210	
40				1250								VD4 12.12.40 p210	
50									1250			VD4 12.12.50 p210	
20								1600				VD4 12.16.20 p210	
25								1600				VD4 12.16.25 p210	
31.5								1600				VD4 12.16.32 p210	
40				1600								VD4 12.16.40 p210	
50									1600			VD4 12.16.50 p210	
20								2000				VD4 12.20.20 p210	
25								2000				VD4 12.20.25 p210	
31,5								2000				VD4 12.20.32 p210	
40								2000				VD4 12.20.40 p210	
50									2000			VD4 12.20.50 p210	
20										2500			
25											2500		
31.5												2500	
40												2500	

H = Height of circuit breaker.
W = Width of circuit breaker.
D = Depth of circuit breaker.
u/l = Distance between bottom and top terminals.
l/g = Distance between bottom terminal and bearing surface of circuit breaker.
P = Horizontal center distance of poles.

На основании чл.36а
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VD4 fixed circuit breaker without bottom and top terminals (12 kV)

Ur	Isc	Rated thermal current (40°C) [A]												Circuit breaker type			
		H=461			H=589			H=599			H=610				H=636		H=677,5
kV	kA	D=424			D=424			D=424			D=459			D=459		D=459	
		u/l=205			u/l=310			u/l=310			u/l=310			u/l=310		u/l=310	
		l/g=217.5			l/g=238			l/g=237.5			l/g=237			l/g=237		l/g=237	
		P=150	P=210	P=275	P=210	P=275	P=150	P=210	P=275	P=210	P=275	P=275	P=275				
		W=450	W=570	W=700	W=570	W=700	W=450	W=570	W=700	W=600	W=750	W=750	W=750				
12	16	630											VD4 12.06.16 p275				
	20	630											VD4 12.06.20 p275				
	25	630											VD4 12.06.25 p275				
	31.5	630											VD4 12.06.32 p275				
	16	1250											VD4 12.12.16 p275				
	20	1250											VD4 12.12.20 p275				
	25	1250											VD4 12.12.25 p275				
	31.5	1250											VD4 12.12.32 p275				
	40	1250												VD4 12.12.40 p275			
	50										1250			VD4 12.12.50 p275			
	63												1250	VD4 12.12.63 p275			
	20									1600				VD4 12.16.20 p275			
	25									1600				VD4 12.16.25 p275			
	31.5									1600				VD4 12.16.32 p275			
	40	1600												VD4 12.16.40 p275			
	50										1600			VD4 12.16.50 p275			
	63												1600	VD4 12.16.63 p275			
	20									2000				VD4 12.20.20 p275			
	25									2000				VD4 12.20.25 p275			
	31.5									2000				VD4 12.20.32 p275			
	40									2000				VD4 12.20.40 p275			
	50										2000			VD4 12.20.50 p275			
	63												2000	VD4 12.20.63 p275			
	20									2500				VD4 12.25.20 p275			
	25									2500				VD4 12.25.25 p275			
	31.5									2500				VD4 12.25.32 p275			
	40									2500				VD4 12.25.40 p275			
	50										2500			VD4 12.25.50 p275			
	63												2500	VD4 12.25.63 p275			
	20												3150 (*)	VD4 12.32.20 p275			
25												3150 (*)	VD4 12.32.25 p275				
31.5												3150 (*)	VD4 12.32.32 p275				
40												3150 (*)					
50												3150 (*)					

H = Height of circuit breaker.
 W = Width of circuit breaker.
 D = Depth of circuit breaker.
 u/l = Distance between bottom and top terminals.
 l/g = Distance between bottom terminal and bearing surface of circuit breaker.
 P = Horizontal center distance of poles.
 (*) Up to 4000 A with forced ventilation.

На основании чл.36а
 ал.3 от ЗОП

6000005

Selection and ordering

Fixed circuit breakers

VD4 fixed circuit breaker without bottom and top terminals (17.5 kV)

Ur	Isc	Rated thermal current (40 °C) [A]										Circuit breaker type
		H=461		H=589		H=599		H=610		H=635		
kV	kA	D=424		D=424		D=424		D=459		D=459		
		u/l=205		u/l=310		u/l=310		u/l=310		u/l=310		
		l/g=217.5		l/g=238		l/g=237.5		l/g=237		l/g=237.5		
		P=150	P=210	P=275	P=210	P=275	P=150	P=210	P=275	P=210	P=275	P=275
		W=450	W=570	W=700	W=570	W=700	W=450	W=570	W=700	W=600	W=750	W=750
16	630											VD4 17.06.16 p150
20	630											VD4 17.06.20 p150
25	630											VD4 17.06.25 p150
31.5	630											VD4 17.06.32 p150
16	1250											VD4 17.12.16 p150
20	1250											VD4 17.12.20 p150
25	1250											VD4 17.12.25 p150
31.5	1250											VD4 17.12.32 p150
16	630											VD4 17.06.16 p210
20	630											VD4 17.06.20 p210
25	630											VD4 17.06.25 p210
31.5	630											VD4 17.06.32 p210
16	1250											VD4 17.12.16 p210
20	1250											VD4 17.12.20 p210
25	1250											VD4 17.12.25 p210
31.5	1250											VD4 17.12.32 p210
40		1250										VD4 17.12.40 p210
50												VD4 17.12.50 p210
20												VD4 17.16.20 p210
25												VD4 17.16.25 p210
31.5												VD4 17.16.32 p210
40		1600										VD4 17.16.40 p210
50												VD4 17.16.50 p210
20												VD4 17.20.20 p210
25												VD4 17.20.25 p210
31.5												VD4 17.20.32 p210
40												VD4 17.20.40 p210
50												VD4 17.20.50 p210

H = Height of circuit breaker.
W = Width of circuit breaker.
D = Depth of circuit breaker.
u/l = Distance between bottom and top terminals.
l/g = Distance between bottom terminal and bearing surface of circuit breaker.
P = Horizontal center distance of poles.

На основании чл.36а
ал.3 от ЗОП

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VD4 fixed circuit breaker without bottom and top terminals (17.5 kV)

Ur	Isc	Rated thermal current (40 °C) [A]												
		H=461			H=589		H=599		H=610		H=635			
kV	kA	D=424			D=424		D=424		D=459		D=459		Circuit breaker type	
		u/l=205			u/l=310		u/l=310		u/l=310		u/l=310			
		l/g=217.5			l/g=238		l/g=237.5		l/g=237		l/g=237.5			
		P=150	P=210	P=275	P=210	P=275	P=150	P=210	P=275	P=210	P=275	P=275		
		W=450	W=570	W=700	W=570	W=700	W=450	W=570	W=700	W=600	W=750	W=750		
16		630										VD4 17.06.16 p275		
20		630										VD4 17.06.20 p275		
25		630										VD4 17.06.25 p275		
31.5		630										VD4 17.06.32 p275		
16		1250										VD4 17.12.16 p275		
20		1250										VD4 17.12.20 p275		
25		1250										VD4 17.12.25 p275		
31.5		1250										VD4 17.12.32 p275		
40		1250												VD4 17.12.40 p275
50									1250					VD4 17.12.50 p275
20									1600					VD4 17.16.20 p275
25									1600					VD4 17.16.25 p275
31.5									1600					VD4 17.16.32 p275
40		1600												VD4 17.16.40 p275
50									1600					VD4 17.16.50 p275
17.5									2000					VD4 17.20.20 p275
25									2000					VD4 17.20.25 p275
31.5									2000					VD4 17.20.32 p275
40									2000					VD4 17.20.40 p275
50									2000					VD4 17.20.50 p275
20									2500					VD4 17.25.20 p275
25									2500					VD4 17.25.25 p275
31.5									2500					VD4 17.25.32 p275
40									2500					VD4 17.25.40 p275
50									2500					VD4 17.25.50 p275
20														3150 (†) VD4 17.32.20 p275
25														3150 (†) VD4 17.32.25 p275
31.5														3150 (†) VD4 17.32.32 p275
40														3150 (†) VD4 17.32.40 p275
50														3150 (†) VD4 17.32.50 p275

- H = Height of circuit breaker
- W = Width of circuit breaker
- D = Depth of circuit breaker
- u/l = Distance between bottom and top terminals
- l/g = Distance between bottom terminal and bearing surface of circuit breaker
- P = Horizontal center distance of poles
- (†) Up to 4000 A with forced ventilation.

На основании чл.36а
ал.3 от ЗОП

010001

Selection and ordering

Fixed circuit breakers

VD4 fixed circuit breaker without bottom and top terminals (24 kV)

Ur	Isc	Rated thermal current (40 °C) [A]			Circuit breaker type
		H=631	H=642		
kV	kA	D=424	D=424		
		u/l=310	u/l=310		
		l/g=282.5	l/g=282.5		
		P=210	P=275	P=275	
		W=570	W=700	W=700	
	16	630			VD4 24.06.16 p210
	20	630			VD4 24.06.20 p210
	25	630			VD4 24.06.25 p210
	16	1250			VD4 24.12.16 p210
	20	1250			VD4 24.12.20 p210
	25	1250			VD4 24.12.25 p210
	31.5	1250			VD4 24.12.32 p210
	16		630		VD4 24.06.16 p275
	20		630		VD4 24.06.20 p275
	25		630		VD4 24.06.25 p275
	16		1250		VD4 24.12.16 p275
24	20		1250		VD4 24.12.20 p275
	25		1250		VD4 24.12.25 p275
	16			1600	VD4 24.16.16 p275
	20			1600	VD4 24.16.20 p275
	25			1600	VD4 24.16.25 p275
	31.5			1600	VD4 24.16.32 p275
	16			2000	VD4 24.20.16 p275
	20			2000	VD4 24.20.20 p275
	25			2000	VD4 24.20.25 p275
	31,5			2000	VD4 24.20.32 p275
	25			2500	VD4 24.25.25 p275
	31.5			2500	VD4 24.25.32 p275

H = Height of circuit breaker.

W = Width of circuit breaker.

D = Depth of circuit breaker.

u/l = Distance between bottom and top terminals.

l/g = Distance between bottom terminal and bearing surface of circuit breaker.

P = Horizontal center distance of poles.

На основании чл.36а
ал.3 от ЗОП

650023

VD4 fixed circuit breaker without bottom and top terminals (36 kV)

Ur	Isc	Rated thermal current (40 °C) [A]	
kV	kA	H = 884	Circuit breaker type
		W = 796	
		D = 501	
		u/l = 328	
		l/g = 428.5	
		P = 275	
36	20	1250 A	VD4 36.12.20 p275
	25	1250 A	VD4 36.12.25 p275
	31.5	1250 A	VD4 36.12.32 p275
	20	1600 A	VD4 36.16.20 p275
	25	1600 A	VD4 36.16.25 p275
	31.5	1600 A	VD4 36.16.32 p275
	20	2000 A	VD4 36.20.20 p275
	25	2000 A	VD4 36.20.25 p275
	31.5	2000 A	VD4 36.20.32 p275
	20	2500 A	VD4 36.25.20 p275
	25	2500 A	VD4 36.25.25 p275
	31.5	2500 A	VD4 36.25.32 p275

H = Height of circuit breaker.

W = Width of circuit breaker.

D = Depth of circuit breaker.

u/l = Distance between bottom and top terminals.

l/g = Distance between bottom terminal and bearing surface of circuit breaker.

P = Horizontal center distance of poles

На основание чл.36а
ал.3 от ЗОП

Selection and ordering

Fixed circuit breakers

VD4 (36 kV) fixed circuit breaker

Ur	Isc	Rated thermal current (40 °C) [A]		Circuit breaker type
kV	kA	H= 1575		
		W= 555		
		D= 1000		
		u/l=328		
		l/g=900		
		P=360		
36	16	630A	VD4 36.06.16 p360	
	20	630A	VD4 36.06.20 p360	
	16	1250A	VD4 36.12.16 p360	
	20	1250A	VD4 36.12.20 p360	
	25	1250A	VD4 36.12.25 p360	
	31.5	1250A	VD4 36.12.31 p360	
	40	1250A	VD4 36.12.40 p360	
	25	1600A	VD4 36.16.25 p360	
	31.5	1600A	VD4 36.16.31 p360	
	40	1600A	VD4 36.16.40 p360	
	25	2000A	VD4 36.20.25 p360	
	31.5	2000A	VD4 36.20.31 p360	
	40	2000A	VD4 36.20.40 p360	
	25	2500A	VD4 36.25.25 p360	
	31.5	2500A	VD4 36.25.31 p360	
	40	2500A	VD4 36.25.40 p360	

H = Height of circuit breaker
W = Width of circuit breaker.
D = Depth of circuit breaker.
u/l = Distance between bottom and top terminals.
l/g = Distance between bottom terminal and bearing surface of circuit breaker.
P = Horizontal center distance of poles.

VD4 (38 kV) fixed circuit breaker

Ur	Isc	Rated thermal current (40 °C) [A]		Circuit breaker type
kV	kA	H = 884		
		W = 796		
		P = 501		
		u/l = 328		
		l/g = 490		
		I = 275		
38	31.5	1200 A	VD4 38.31.5 p360	
	31.5	2000 A	VD4 38.31.5 p360	

H = Height of circuit breaker
W = Width of circuit breaker.
D = Depth of circuit breaker.
u/l = Distance between bottom and top terminals.
l/g = Distance between bottom terminal and bearing surface of circuit breaker.
P = Horizontal center distance of poles.

На основание чл.36а
ал.3 от ЗОП

VD4 (40 kV) fixed circuit breaker

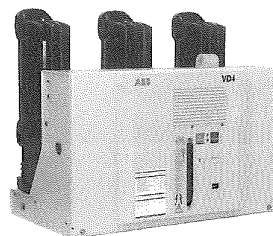
Ur	Isc	Rated thermal current (40 °C) [A]		Circuit breaker type
kV	kA	H= 1575		
		W= 555		
		D= 1000		
		u/I=328		
		I/g=900		
		P=360		
40	16	630A		VD4 40.06.16 p360
	20	630A		VD4 40.06.20 p360
	16	1250A		VD4 40.12.16 p360
	20	1250A		VD4 40.12.20 p360
	25	1250A		VD4 40.12.25 p360
	31.5	1250A		VD4 40.12.31 p360
	40	1250A		VD4 40.12.40 p360
	25	1600A		VD4 40.16.25 p360
	31.5	1600A		VD4 40.16.31 p360
	40	1600A		VD4 40.16.40 p360
	25	2000A		VD4 40.20.25 p360
	31.5	2000A		VD4 40.20.31 p360
	40	2000A		VD4 40.20.40 p360
	25	2500A		VD4 40.25.25 p360
	31.5	2500A		VD4 40.25.31 p360
	40	2500A		VD4 40.25.40 p360

Standard equipment of fixed circuit breakers

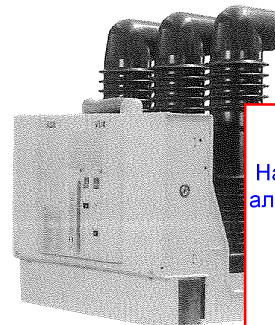
The basic versions of the fixed circuit breakers are three-pole and equipped with:

- EL or Classic manual operating mechanism
- mechanical signaling device for closing springs loaded/discharged
- mechanical signaling device for circuit breaker open/closed

- closing pushbutton, opening pushbutton and operation counter
 - set of ten auxiliary circuit breaker break/make contacts
- Note: three break contacts (signaling circuit breaker open) and five make contacts (signaling circuit breaker closed) are available with the group of ten auxiliary contacts supplied as standard and the maximum number of electrical applications.
- lever built into operating mechanism for linear loading of closing spring.



VD4 - up to 24 kV



VD4 - 36 kV

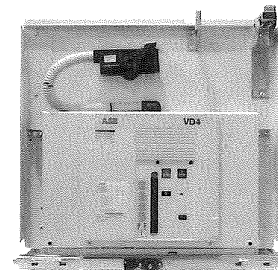
000011

На основании чл.36а
ал.3 от ЗОП

Selection and ordering

Withdrawable circuit breakers

Withdrawable circuit breakers
for UniGear ZS1 switchgear (12 kV) ⁽⁵⁾



Circuit breaker		VD4/P 12							
Standards	IEC 62271-100 •								
Rated voltage	Ur [kV]	12 (*)							
Rated insulation voltage	Us [kV]	12							
Withstand voltage at 50 Hz	Ud (1 min) [kV]	28							
Impulse withstand voltage	Up [kV]	75							
Rated frequency	fr [Hz]	50-60							
Rated thermal current (40 °C) ⁽¹⁾	Ir [A]	630	1250	1250	1250	1600	1600		
		16	16	-	-	-	-		
Rated breaking capacity (rated symmetrical short-circuit current)	Isc [kA]	20	20	-	-	20	20		
		25	25	-	-	25	25		
		31.5	31.5	-	-	31.5	31.5		
		-	-	40	40	-	-		
		-	-	-	-	50	-		
Admissible rated short-time withstand current (3s)	Ik [kA]	16	16	-	-	-	-		
		20	20	-	-	20	20		
		25	25	-	-	25	25		
		31.5	31.5	-	-	31.5	31.5		
		-	-	40	40	-	-		
Making capacity	Ip [kA]	-	-	-	-	50	-		
		40	40	-	-	-	-		
		50	50	-	-	50	50		
		63	63	-	-	63	63		
		80	80	-	-	80	80		
Operation sequence	[O - 0.3 s - CO - 15 s - CO] •	-	-	100	100	-	-		
		-	-	-	-	125	-		
		40	40	-	-	-	-		
		50	50	-	-	-	-		
		63	63	-	-	-	-		
Opening time	[ms]	33 ... 60							
		10 ... 15							
		43 ... 75							
		30 ... 60							
		30 ... 60							
Maximum overall dimensions		H [mm]	628	628	691	691	691	691	
		W [mm]	503	503	653	853	681	653	853
		D [mm]	662	662	641	642	643	642	642
		Pole center distance P [mm]	150	150	210	275	210	210	275
Weight	[kg]	116 ⁽⁶⁾	116 ⁽⁶⁾	174	176	180	160	166	
		TN 7412 ⁽³⁾	7412 ⁽³⁾	-	-	-	7415 ⁽³⁾	7416 ⁽³⁾	
Standardized dimensions table	1VCD	-	-	003284 ⁽³⁾	003286 ⁽³⁾	003444	-	-	
Operating temperature	[°C]	- 5 ... + 40							
Tropicalization	IEC: 60068-2-30, 60721-2-1 •								
Electromagnetic compatibility	IEC: 62271-1 •								

() Rated current guaranteed with circuit breaker installed in UniGear ZS1 switchgear and with 40 °C ambient temperature.

() Up to 4000 A with forced ventilation

() Poles in polyamide

() Available in 10 kV voltage version to GOST standards

() On request, the closing spring can be loaded by means of a removable crank handle outside the operating mechanism (instead of linear loading, only possible means of a lever built into the front of the operating mechanism)

() Consult ABB for the versions with 210 mm pole center distance

На основании чл.36а
ал.3 от ЗОП

000072

.											
12 (*)											
12											
28											
75											
50-60											
1600	1600	1600	1600	2000	2000	2000	2000	2500	2500	3150 (?)	3150 (?)
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	20	20	-	-	20	-	20	-
-	-	-	-	25	25	-	-	25	-	25	-
-	-	-	-	31.5	31.5	-	-	31.5	-	31.5	-
40	40	-	-	40	40	-	-	40	-	40	-
-	-	50	50	-	-	50	50	-	50	-	50
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	20	20	-	-	20	-	20	-
-	-	-	-	25	25	-	-	25	-	25	-
-	-	-	-	31.5	31.5	-	-	31.5	-	31.5	-
40	40	-	-	40	40	-	-	40	-	40	-
-	-	50	50	-	-	50	50	-	50	-	50
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	50	50	-	-	50	-	50	-
-	-	-	-	63	63	-	-	63	-	63	-
-	-	-	-	80	80	-	-	80	-	80	-
100	100	-	-	100	100	-	-	100	-	100	-
-	-	125	125	-	-	125	125	-	125	-	125
.											
33 ... 60											
10 ... 15											
43 ... 75											
30 ... 60											
691	691	691	691	691	691	691	691	691	691	730	742
653	853	681	853	653	853	681	853	853	853	853	853
641	642	643	643	642	642	643	643	640	643	640	643
210	275	210	275	210	275	210	275	275	275	275	275
174	176	180	193	160	166	190	205	186	225	221	240
-	-	-	-	7415(?)	7416(?)	-	-	7417(?)	-	-	-
003284(?)	003286(?)	003444	003445	-	-	003444	003445	-	003446	000	000
- 5 ... + 40											
.											
.											

На основании чл.36а
ал.3 от ЗОП

050073

Selection and ordering

Withdrawable circuit breakers

Withdrawable circuit breakers
for UniGear ZS1 switchgear (17.5 kV) (4)



Circuit breaker	VD4/P 17								
Standards	IEC 62271-100 *								
Rated voltage	Ur [kV]	17.5							
Rated insulation voltage	Us [kV]	17.5							
Withstand voltage at 50 Hz	Ud (1 min) [kV]	38							
Impulse withstand voltage	Up [kV]	95							
Rated frequency	fr [Hz]	50-60							
Rated thermal current (40 °C) (1)	Ir [A]	630	1250	1250	1250	1250	1600	1600	
		16	16	-	-	-	-	-	
		20	20	-	-	-	20	20	
		25	25	-	-	-	25	25	
		31.5	31.5	-	-	-	31.5	31.5	
Rated breaking capacity (rated symmetrical short-circuit current)	Isc [kA]	-	-	40	40	-	-	-	
		-	-	-	-	50	-	-	
		16	16	-	-	-	-	-	
		20	20	-	-	-	20	20	
		25	25	-	-	-	25	25	
Admissible rated short-time withstand current (3s)	Ik [kA]	31.5	31.5	-	-	-	31.5	31.5	
		-	-	40	40	-	-	-	
		-	-	-	-	50	-	-	
		40	40	-	-	-	-	-	
		50	50	-	-	-	50	50	
Making capacity	Ip [kA]	63	63	-	-	-	63	63	
		80	80	-	-	-	80	80	
		-	-	100	100	-	-	-	
		-	-	-	-	125	-	-	
		-	-	-	-	-	-	-	
Operation sequence	[O - 0.3 s - CO - 15 s - CO] *								
Opening time	[ms]	33 ... 60							
Arcing time	[ms]	10 ... 15							
Total breaking time	[ms]	43 ... 75							
Closing time	[ms]	30 ... 60							
Maximum overall dimensions		H [mm]	632	632	691	691	691	691	
		W [mm]	503	503	653	853	681	653	853
		D [mm]	664	664	641	642	643	642	642
		Pole center distance P [mm]	150	150	210	275	210	210	275
Weight	[kg]	116	116	174	176	180	160	166	
Standardized dimensions table	TN	7412(3)	7412(3)	-	-	-	-	-	
	1VCD	-	-	003284(3)	003286(3)	003444	-	-	
Operating temperature	[°C]	- 5 ... + 40							
Tropicalization	IEC: 60068-2-30, 60721-2-1 *								
Electromagnetic compatibility	IEC: 62271-1 *								

(1) Rated current guaranteed with circuit breaker installed in UniGear ZS1 switchgear and with 40 °C ambient temperature.

(2) Up to 4000 A with forced ventilation.

(3) Poles in polyamide

(4) On request, the closing spring can be loaded by means of a removable crank handle outside the operating mechanism (instead of linear loading, only possible with the door open, by means of a lever built into the front of the operating mechanism).

На основе чл.36а
ал.3 от ЗОП

050072

[Handwritten signatures]

•											
17.5											
17.5											
38											
95											
50-60											
1600	1600	1600	1600	2000	2000	2000	2000	2500	2500	3150 (°)	3150 (°)
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	20	20	-	-	20	-	20	-
-	-	-	-	25	25	-	-	25	-	25	-
-	-	-	-	31.5	31.5	-	-	31.5	-	31.5	-
40	40	-	-	40	40	-	-	40	-	40	-
-	-	50	50	-	-	50	50	-	50	-	50
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	20	20	-	-	20	-	20	-
-	-	-	-	25	25	-	-	25	-	25	-
-	-	-	-	31.5	31.5	-	-	31.5	-	31.5	-
40	40	-	-	40	40	-	-	40	-	40	-
-	-	50	50	-	-	50	50	-	50	-	50
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	50	50	-	-	50	-	50	-
-	-	-	-	63	63	-	-	63	-	63	-
-	-	-	-	80	80	-	-	80	-	80	-
100	100	-	-	100	100	-	-	100	-	100	-
-	-	125	125	-	-	125	125	-	125	-	125
•											
33 ... 60											
10 ... 15											
43 ... 75											
30 ... 60											
691	691	691	691	691	691	691	691	691	691	730	742
653	853	681	853	653	853	681	853	853	853	853	853
641	642	643	643	642	642	643	643	640	643	640	643
210	275	210	275	210	275	210	275	275	275	275	275
174	176	180	193	160	166	190	205	186	225	225	225
-	-	-	-	7415(°)	7416(°)	-	-	7417(°)	-	-	-
003284(°)	003286(°)	003444	003445	-	-	003444	003445	-	003446	003446	003446
- 5 ... + 40											
•											
•											

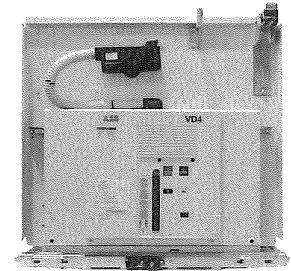
На основание чл.36а ал.3 от ЗОП

050075

Selection and ordering

Withdrawable circuit breakers

Withdrawable circuit breakers
for UniGear ZS1 switchgear (24 kV) ⁽⁵⁾



Circuit breaker	VD4/P 24									
Standards	IEC 62271-100 •									
Rated voltage	Ur [kV] 24									
Rated insulation voltage	Us [kV] 24									
Withstand voltage at 50 Hz	Ud (1 min) [kV] 50									
Impulse withstand voltage	Up [kV] 125									
Rated frequency	fr [Hz] 50-60									
Rated thermal current (40 °C) ⁽¹⁾	Ir [A]	630	630	1250	1250	1600 ⁽⁶⁾	2000 ⁽⁶⁾	2500 ⁽⁷⁾ ⁽⁸⁾	3150 ⁽⁹⁾ ⁽⁸⁾	
		16	16	16	16	16	16	16	-	
Rated breaking capacity (rated symmetrical short-circuit current)	Isc [kA]	20	20	20	20	20	20	20	-	
		25 ⁽⁶⁾	25 ⁽⁶⁾	25 ⁽⁶⁾	25 ⁽⁶⁾	25	25	25	-	
		-	-	31.5 ⁽⁶⁾	31.5 ⁽⁶⁾	31.5	31.5	31.5	31.5	
		16	16	16	16	16	16	16	-	
Admissible rated short-time withstand current (3s)	Ik [kA]	20	20	20	20	20	20	20	-	
		25	25	25	25	25	25	25	-	
		-	-	31.5	31.5	31.5	31.5	31.5	31.5	
		40	40	40	40	40	40	40	-	
Making capacity	Ip [kA]	50	50	50	50	50	50	50	-	
		63	63	63	63	63	63	63	-	
		-	-	80	80	80	80	80	80	
		-	-	-	-	-	-	-	-	
Operation sequence	[O - 0.3 s - CO - 15 s - CO] • • • • • • • •									
Opening time	[ms]	33 ... 60								
Arcing time	[ms]	10 ... 15								
Total breaking time	[ms]	43 ... 75								
Closing time	[ms]	30 ... 60								
Maximum overall dimensions		H [mm]	794	794	794	794	838	838	838	838
		W [mm]	653	853	653	853	853	853	853	853
		D [mm]	802	802	802	802	790	790	790	790
		Pole center distance P [mm]	210	275	210	275	275	275	275	275
Weight	[kg]	140	148	140/146 ⁽¹⁾	148	228	228	228	277	
Standardized dimensions table	TN	7413	7414	7413	7414	7418	7418	7418	-	
	1VCD	-	-	000173 ⁽¹⁾	000174 ⁽¹⁾	-	-	-	000177	
Operating temperature	[°C]	- 5 ... + 40								
Tropicalization	IEC: 60068-2-30, 60721-2-1 •									
Electromagnetic compatibility	IEC: 62271-1 •									

⁽¹⁾ Rated current guaranteed with circuit breaker installed in UniGear ZS1 switchgear and with 40 °C ambient temperature.

⁽²⁾ 2300 A rated current guaranteed with natural ventilation; 2500 A rated current guaranteed with forced ventilation.

⁽³⁾ 2700 A rated current guaranteed with natural ventilation; 3150 A rated current guaranteed with forced ventilation.

⁽⁴⁾ 31.5 kA version.

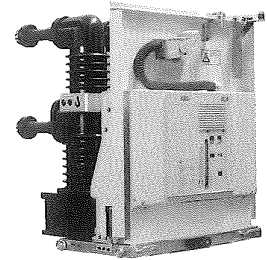
⁽⁵⁾ On request, the closing spring can be loaded by means of a removable crank handle outside the operating mechanism (instead of linear loading, means of a lever built into the front of the operating mechanism).

⁽⁶⁾ Contact ABB for the 27 kV version

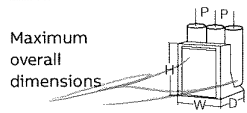
На основе чл.36а
ал.3 от ЗОП

000078

Withdrawable circuit breakers for UniGear ZS2 switchgear and Powerbloc modules (36 kV)



Circuit breaker		VD4/W 36				
Standards	IEC 62271-100 •					
Rated voltage	Ur [kV]	36				
Rated insulation voltage	Us [kV]	36				
Withstand voltage at 50 Hz	Ud (1 min) [kV]	70				
Impulse withstand voltage	Up [kV]	170				
Rated frequency	fr [Hz]	50				
Rated thermal current (40 °C) (1)	Ir [A]	1250	1600	2000	2500 (1)	3150 (2)
		20	20	20	20	20
Rated breaking capacity (rated symmetrical short-circuit current)	Isc [kA]	25	25	25	25	25
		31.5	31.5	31.5	31.5	31.5
		20	20	20	20	20
Admissible rated short-time withstand current (3s)	Ik [kA]	25	25	25	25	25
		31.5	31.5	31.5	31.5	31.5
		50	50	50	50	50
Making capacity	Ip [kA]	63	63	63	63	63
		80	80	80	80	80
Operation sequence	[O - 0.3 s - CO - 15 s - CO] •	•	•	•	•	•
Opening time	[ms]	35 ... 60				
Arcing time	[ms]	10 ... 15				
Total breaking time	[ms]	45 ... 75				
Closing time	[ms]	50 ... 65				
Maximum overall dimensions	H [mm]	974	974	974	974	974
	W [mm]	880	880	880	880	880
	D [mm]	789	789	789	789	789
	Pole center distance P [mm]	275	275	275	275	275
Weight	[kg]	230	245	275	275/315	315
Standardized dimensions table	TN	1VYN300901-KG	1VYN300901-RA	1VYN300901-RA	1VYN300901-RA (1)	1VYN300901-RB 1VYN300901-RB
Operating temperature	[°C]	- 5 ... + 40				
Tropicalization	IEC: 60068-2-30, 60721-2-1 •					
Electromagnetic compatibility	IEC: 62271-1 •					



(1) 2500 A with forced ventilation and 79 mm diameter tulip contacts TN 1VYN300901 RA.
 (2) 3150 A with forced ventilation.

На основании чл.36а
 ал.3 от ЗОП

000077

Списък на типовете изпитания направени за прекъсвачи тип VD4 12.12.32 P 210, и тип VD4 12.25.32 P 210:

Типови тестове	Съгласно:
Диелектрични тестови	IEC 62271-100 субклауза 6.2
Измерване съпротивлението на главната верига и тестове за повишаване на температурата	IEC 62271-100 субклауза 6.4 – 6.5
Тестове при ток на късо съединение и тестове при пиков(върхов) ток на късо съединение	IEC 62271-100 субклауза 6.6
Тест за работа на механиката при температура на окръжаващата среда	IEC 62271-100 субклауза 6.101.2
Тестове на прекъсвача за максимални токове на късо съединение които може да проведе при включено състояние и при изключване на прекъсвача	IEC 62271-100 субклауза 6.102 до 6.106

На основание чл.36а
ал.3 от ЗОП

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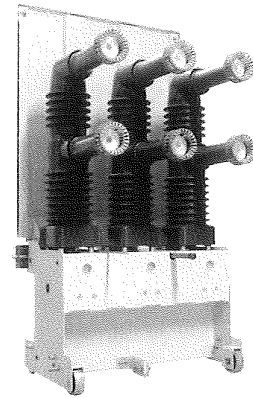
000073

Selection and ordering

Withdrawable circuit breakers

Withdrawable circuit breakers in floor rolling version
for UniGear ZS3.2 switchgear and Powerbloc modules
(36 kV)^(*)

(*) Up to 31.5 kA for UniGear ZS3.2.



Circuit breaker	VD4/P 36						
Standards	IEC 62271-100 •						
Rated voltage	Ur [kV]	36					
Rated insulation voltage	Us [kV]	36					
Withstand voltage at 50 Hz	Ud (1 min) [kV]	95					
Impulse withstand voltage	Up [kV]	185					
Rated frequency	fr [Hz]	50-60					
Rated thermal current (40 °C)	Ir [A]	630	1250	1600	2000	2500 ^(*)	3150 ^(*)
		16	16	-	-	-	-
Rated breaking capacity (rated symmetrical short-circuit current)	Isc [kA]	20	25	-	-	-	-
		-	25	25	25	25	25
		-	31.5	31.5	31.5	31.5	31.5
		-	40	40	40	40	-
Admissible rated short-time withstand current (3s)	Ik [kA]	16	16	-	-	-	-
		20	25	-	-	-	-
		-	25	25	25	25	25
		-	31.5	31.5	31.5	31.5	31.5
Making capacity	Ip [kA]	-	40	40	40	40	-
		40	40	-	-	-	-
		50	50	-	-	-	-
		-	63	63	63	63	63
Operation sequence	[O - 0.3 s - CO - 15 s - CO] •	-	80	80	80	80	80
		-	80	80	80	80	80
		-	100	100	100	100	-
		-	100	100	100	100	-
Opening time	[ms]	≤45					
Arcing time	[ms]	≤15					
Total breaking time	[ms]	≤60					
Closing time ^①	[ms]	approx. 60					
Maximum overall dimensions	H [mm]	1575	1575	1575	1575	1575	1575
	W [mm]	840	840	840	840	840	840
	D [mm]	685	685	685	685	685	685
	Pole center distance P [mm]	280	280	280	280	280	280
Weight	[kg]	290	290	340	340	340	340
Standardized dimensions table	TN	GCEM 700198					
Operating temperature	[°C]	- 5 ... + 40					
Tropicalization	IEC: 60068-2-30, 60721-2-1	•	•	•	•	•	•
Electromagnetic compatibility	IEC: 62271-1	•	•	•	•	•	•

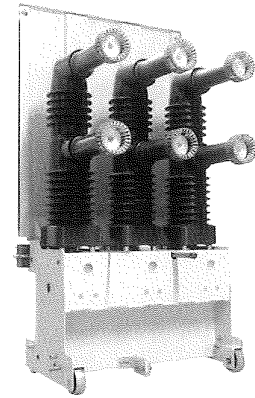
(*) version only available with forced ventilation and assembled pole

На основе чл.36а
ал.3 от ЗОП

030079

General characteristics of withdrawable circuit breakers for UniGear ZS3.2 and Powerbloc modules (40 kV)^(*)

(*) Up to 31.5 kA for UniGear ZS3.2.



Circuit breaker		VD4/P 40					
Standards	IEC 62271-100 •						
Rated voltage	Ur [kV]	40.5					
Rated insulation voltage	Us [kV]	40.5					
Withstand voltage at 50 Hz	Ud (1 min) [kV]	95					
Impulse withstand voltage	Up [kV]	200					
Rated frequency	fr [Hz]	50-60					
Rated thermal current (40 °C)	Ir [A]	630	1250	1600	2000	2500	3150 (*)
		16	16	-	-	-	-
Rated breaking capacity (rated symmetrical short-circuit current)	Isc [kA]	20	20	-	-	-	-
		-	25	25	25	25	25
		-	31.5	31.5	31.5	31.5	31.5
		-	40	40	40	40	-
Admissible rated short-time withstand current (3s)	Ik [kA]	16	16	-	-	-	-
		20	20	-	-	-	-
		-	25	25	25	25	25
		-	31.5	31.5	31.5	31.5	31.5
Making capacity	Ip [kA]	-	40	40	-	-	-
		-	50	50	-	-	-
		-	63	63	63	63	63
		-	80	80	80	80	80
Operation sequence	[O - 0.3 s - CO - 15 s - CO]	• - - - - •					
Opening time	[ms]	≤45					
Arcing time	[ms]	≤15					
Total breaking time	[ms]	≤60					
Closing time	[ms]	approx. 60					
Maximum overall dimensions	H [mm]	1575	1575	1575	1575	1575	1575
	W [mm]	840	840	840	840	840	840
	D [mm]	685	685	685	685	685	685
	Pole center distance P [mm]	280	280	280	280	280	280
Weight	[kg]	290	290	340	340	340	380
Standardized dimensions table	TN	GCEM 700198					
Operating temperature	[°C]	- 5° ... + 40°					
Tropicalization	IEC: 60068-2-30, 60721-2-1	•					
Electromagnetic compatibility	IEC: 62271-1	•					

(*) version only available with forced ventilation and assembled pole

На основании чл.36а
ал.3 от ЗОП

020030

Selection and ordering

Withdrawable circuit breakers

Types of withdrawable circuit breakers available for UniGear ZS1 switchgear

Complete the circuit breaker selected with the optional accessories indicated on the following pages.

VD4 (12 kV) withdrawable circuit breaker

Ur	Isc	Rated thermal current (40 °C) [A]					Circuit breaker type
		W=650 P=150 u/l=205 ø=35	W=800 P=210 u/l=310 ø=79	W=1000 P=275 u/l=310 ø=79	W=1000 P=275 u/l=310 ø=109	W=1000 P=275 u/l=310 ø=109	
12	16	630					VD4/P 12.06.16 p150
	20	630					VD4/P 12.06.20 p150
	25	630					VD4/P 12.06.25 p150
	31.5	630					VD4/P 12.06.32 p150
	16	1250					VD4/P 12.12.16 p150
	20	1250					VD4/P 12.12.20 p150
	25	1250					VD4/P 12.12.25 p150
	31.5	1250					VD4/P 12.12.32 p150
	40		1250				VD4/P 12.12.40 p210
	50		1250				VD4/P 12.12.50 p210
	20		1600				VD4/P 12.16.20 p210
	25		1600				VD4/P 12.16.25 p210
	31.5		1600				VD4/P 12.16.32 p210
	40		1600				VD4/P 12.16.40 p210
	50		1600				VD4/P 12.16.50 p210
	20		2000				VD4/P 12.20.20 p210
	25		2000				VD4/P 12.20.25 p210
	31.5		2000				VD4/P 12.20.32 p210
	40		2000				VD4/P 12.20.40 p210
	50		2000				VD4/P 12.20.50 p210
40			1250			VD4/P 12.12.40 p275	
20			1600			VD4/P 12.16.20 p275	
25			1600			VD4/P 12.16.25 p275	
31.5			1600			VD4/P 12.16.32 p275	
40			1600			VD4/P 12.16.40 p275	
50			1600			VD4/P 12.16.50 p275	
20			2000			VD4/P 12.20.20 p275	
25			2000			VD4/P 12.20.25 p275	
31.5			2000			VD4/P 12.20.32 p275	
40			2000			VD4/P 12.20.40 p275	
50			2000			VD4/P 12.20.50 p275	
20				2500		VD4/P 12.25.20 p275	
25				2500		VD4/P 12.25.25 p275	
31.5				2500		VD4/P 12.25.32 p275	
40				2500		VD4/P 12.25.40 p275	
50				2500		VD4/P 12.25.50 p275	
20					3150 (*)	VD4/P 12.25.20 p3150	
25					3150 (*)	VD4/P 12.25.25 p3150	
31.5					3150 (*)	VD4/P 12.25.32 p3150	
40					3150 (*)	VD4/P 12.25.40 p3150	
50					3150 (*)	VD4/P 12.25.50 p3150	

W = Switchgear width.
P = Horizontal center distance of poles.
u/l = Distance between bottom and top terminals.
ø = Diameter of isolating contact.
(*) Up to 4000 A with forced ventilation.

На основании чл.36а
ал.3 от ЗОП

010031

VD4 (17.5 kV) withdrawable circuit breaker for UniGear ZS1 switchgear

Ur	Isc	Rated thermal current (40 °C) [A]					Circuit breaker type
		W=650	W=800	W=1000	W=1000	W=1000	
		P=150	P=210	P=275	P=275	P=275	
		u/l=205	u/l=310	u/l=310	u/l=310	u/l=310	
kV	kA	ø=35	ø=79	ø=79	ø=109	ø=109	
17.5	16	630					VD4/P 17.06.16 p150
	20	630					VD4/P 17.06.20 p150
	25	630					VD4/P 17.06.25 p150
	31.5	630					VD4/P 17.06.32 p150
	16	1250					VD4/P 17.12.16 p150
	20	1250					VD4/P 17.12.20 p150
	25	1250					VD4/P 17.12.25 p150
	31.5	1250					VD4/P 17.12.32 p150
	40		1250				VD4/P 17.12.40 p210
	50		1250				VD4/P 17.12.50 p210
	20		1600				VD4/P 17.16.20 p210
	25		1600				VD4/P 17.16.25 p210
	31.5		1600				VD4/P 17.16.32 p210
	40		1600				VD4/P 17.16.40 p210
	50		1600				VD4/P 17.16.50 p210
	20		2000				VD4/P 17.20.20 p210
	25		2000				VD4/P 17.20.25 p210
	31.5		2000				VD4/P 17.20.32 p210
	40		2000				VD4/P 17.20.40 p210
	50		2000				VD4/P 17.20.50 p210
	40			1250			VD4/P 17.12.40 p275
	20			1600			VD4/P 17.16.20 p275
	25			1600			VD4/P 17.16.25 p275
	31.5			1600			VD4/P 17.16.32 p275
	40			1600			VD4/P 17.16.40 p275
	50			1600			VD4/P 17.16.50 p275
	20			2000			VD4/P 17.20.20 p275
	25			2000			VD4/P 17.20.25 p275
	31.5			2000			VD4/P 17.20.32 p275
	40			2000			VD4/P 17.20.40 p275
50			2000			VD4/P 17.20.50 p275	
20				2500		VD4/P 17.25.20 p275	
25				2500		VD4/P 17.25.25 p275	
31.5				2500		VD4/P 17.25.32 p275	
40				2500		VD4/P 17.25.40 p275	
50				2500		VD4/P 17.25.50 p275	
20					3150 (!)	VD4/P 17.25.20 p275	
25					3150 (!)	VD4/P 17.25.25 p275	
31.5					3150 (!)	VD4/P 17.25.32 p275	
40					3150 (!)	VD4/P 17.25.40 p275	
50					3150 (!)	VD4/P 17.25.50 p275	

W = Switchgear width.
 P = Horizontal center distance of poles.
 u/l = Distance between bottom and top terminals.
 ø = Diameter of isolating contact.
 (!) Up to 4000 A with forced ventilation.

На основание чл.36а
 ал.3 от ЗОП

000032

Selection and ordering

Withdrawable circuit breakers

VD4 (24 kV) withdrawable circuit breaker for UniGear ZS1 switchgear

Ur	Isc	Rated thermal current (40 °C) [A]				Circuit breaker type
		W=800	W=1000	W=1000	W=1000	
kV	kA	P=210	P=275	P=275	P=275	
		u/l=310	u/l=310	u/l=310	u/l=310	
		ø=35	ø=35	ø=79	ø=109	
24	16	630				VD4/P 24.06.16 p210
	20	630				VD4/P 24.06.20 p210
	25	630				VD4/P 24.06.25 p210
	16	1250				VD4/P 24.12.16 p210
	20	1250				VD4/P 24.12.20 p210
	25	1250				VD4/P 24.12.25 p210
	31.5	1250				VD4/P 24.12.32 p210
	16		630			VD4/P 24.06.16 p275
	20		630			VD4/P 24.06.20 p275
	25		630			VD4/P 24.06.25 p275
	16		1250			VD4/P 24.12.16 p275
	20		1250			VD4/P 24.12.20 p275
	25		1250			VD4/P 24.12.25 p275
	31.5		1250			VD4/P 24.12.32 p275
	16			1600		VD4/P 24.16.16 p275
	20			1600		VD4/P 24.16.20 p275
	25			1600		VD4/P 24.16.25 p275
	31.5			1600		VD4/P 24.16.32 p275
	16			2000		VD4/P 24.20.16 p275
	20			2000		VD4/P 24.20.20 p275
	25			2000		VD4/P 24.20.25 p275
	31.5			2000		VD4/P 24.20.32 p275
	16			2300 (*)		VD4/P 24.25.16 p275
	20			2300 (*)		VD4/P 24.25.20 p275
25			2300 (*)		VD4/P 24.25.25 p275	
31.5			2300 (*)		VD4/P 24.25.32 p275	
31.5				2700 (°)	VD4/P 24.32.32 p275	

W = Switchgear width.

P = Horizontal center distance of poles.

u/l = Distance between bottom and top terminals.

ø = Diameter of isolating contact.

(*) 2500 A rated current guaranteed with forced ventilation.

(°) 3150 A rated current guaranteed with forced ventilation.

На основании чл.36а
ал.3 от ЗОП

000033

VD4 withdrawable circuit breaker in floor rolling version (36 kV)

Ur	Isc	Rated thermal current (40 °C) [A]		Circuit breaker type
		H= 1575	W= 840	
kV	kA	D= 685		
		u/l=328	I/g=900	
		P=280		
36	16	630A		VD4/P 36.06.16 p280
	20	630A		VD4/P 36.06.20 p280
	16	1250A		VD4/P 36.12.16 p280
	20	1250A		VD4/P 36.12.20 p280
	25	1250A		VD4/P 36.12.25 p280
	31.5	1250A		VD4/P 36.12.31 p280
	40	1250A		VD4/P 36.12.40 p280
	25	1600A		VD4/P 36.16.25 p280
	31.5	1600A		VD4/P 36.16.31 p280
	40	1600A		VD4/P 36.16.40 p280
	25	2000A		VD4/P 36.20.25 p280
	31.5	2000A		VD4/P 36.20.31 p280
	40	2000A		VD4/P 36.20.40 p280
	25	2500A		VD4/P 36.25.25 p280
	31.5	2500A		VD4/P 36.25.31 p280
	40	2500A		VD4/P 36.25.40 p280
	25	3150A		VD4/P 36.31.25 p280 (*)
	31.5	3150A		VD4/P 36.31.31 p280 (*)

H = Height of circuit breaker
 W = Switchgear width.
 D = Depth of circuit breaker.
 u/l = Distance between bottom and top terminals.
 I/g = Distance between bottom terminal and bearing surface of circuit breaker.
 P = Horizontal center distance of poles.
 (*) version only available with forced ventilation and assembled pole

На основание чл.36а
 ал.3 от ЗОП

000034

Selection and ordering

Withdrawable circuit breakers

VD4 (36 kV) withdrawable circuit breaker

- H = Height of circuit breaker.
- D = Depth of circuit breaker.
- W = Width of circuit breaker.
- u/l = Distance between bottom and top terminals.
- l/g = Distance between bottom terminal and bearing surface of circuit breaker.
- P = Horizontal center distance of poles.
- (!) 2500 A rated current guaranteed with forced ventilation and 79 mm diameter tulip contacts (TN 1VYN300901-RA)
- (*) 3150 A rated current guaranteed with forced ventilation

Ur	Isc	Rated thermal current (40 °C) [A]		Circuit breaker type
kV	kA	H = 951 - W = 788 - D = 778 - u/l = 380 - l/g = 399 - P = 275		
36	20	1250 A		VD4/W 36.12.20 p275
	25	1250 A		VD4/W 36.12.25 p275
	31.5	1250 A		VD4/W 36.12.32 p275
	20		1600 A	VD4/W 36.16.20 p275
	25		1600 A	VD4/W 36.16.25 p275
	31.5		1600 A	VD4/W 36.16.32 p275
	20		2000 A	VD4/W 36.20.20 p275
	25		2000 A	VD4/W 36.20.25 p275
	31.5		2000 A	VD4/W 36.20.32 p275
	20		2500 A (!)	VD4/W 36.25.20 p275
	25		2500 A (!)	VD4/W 36.25.25 p275
	31.5		2500 A (!)	VD4/W 36.25.32 p275
20			3150 A (*)	VD4/W 36.32.20 p275
25			3150 A (*)	VD4/W 36.32.25 p275
31.5			3150 A (*)	VD4/W 36.32.32 p275

VD4 withdrawable circuit breaker in floor rolling version (40 kV)

- H = Height of circuit breaker.
- D = Depth of circuit breaker.
- W = Width of circuit breaker.
- u/l = Distance between bottom and top terminals.
- l/g = Distance between bottom terminal and bearing surface of circuit breaker.
- P = Horizontal center distance of poles
- () Version only available with forced ventilation and assembled pole

Ur	Isc	Rated thermal current (40 °C) [A]		Circuit breaker type
kV	kA	H= 1575 W= 840 D= 685 u/l=328 l/g=900 P=280		
40	16	630A		VD4/P 40.06.16 p280
	20	630A		VD4/P 40.06.20 p280
	16		1250A	VD4/P 40.12.16 p280
	20		1250A	VD4/P 40.12.20 p280
	25		1250A	VD4/P 40.12.25 p280
	31.5		1250A	VD4/P 40.12.31 p280
	40		1250A	VD4/P 40.12.40 p280
	25		1600A	VD4/P 40.16.25 p280
	31.5		1600A	VD4/P 40.16.31 p280
	40		1600A	VD4/P 40.16.40 p280
	25		2000A	
	31.5		2000A	
40		2000A		
25		2500A		
31.5		2500A		
40		2500A		
25			3150A	
31.5			3150A	

На основании чл.36а
ал.3 от ЗОП

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Standard equipment of withdrawable circuit breakers for UniGear ZS1, ZS2, ZS3.2 switchgear and similar panels

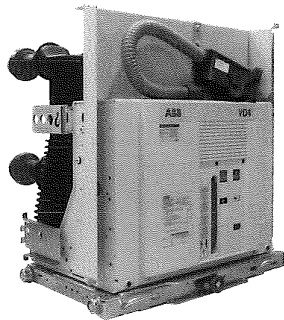
The basic versions of the withdrawable circuit breakers are three-pole and equipped with:

- EL manual operating mechanism
- mechanical signaling device for closing springs loaded/discharged
- mechanical signaling device for circuit breaker open/closed
- closing pushbutton
- opening pushbutton
- operation counter
- set of ten circuit breaker open/closed auxiliary contacts

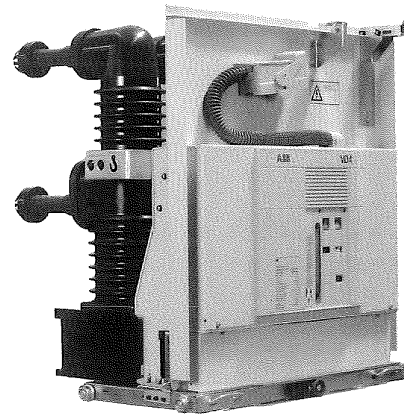
Note: three break contacts (signaling circuit breaker open) and four make contacts (signaling circuit breaker closed) are available with the group of ten auxiliary contacts supplied as standard and the maximum number of electrical applications.

- lever built into operating mechanism for linear loading of closing spring

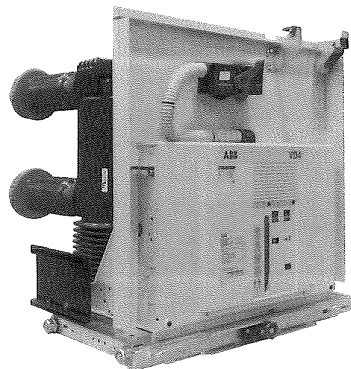
- isolating contacts
- cord with connector (plug only) for auxiliary circuits, with striker pins which prevent the plug from being inserted into the socket if the rated current of the circuit breaker is lower than the rated current of the panel
- racking-out/in lever (the quantity depends on the number of apparatuses ordered)
- locking electromagnet in the truck (mandatory for ABB switchgear). This device prevents the circuit breaker from being racked into the switchgear when the auxiliary circuits are not connected (plug not in in the socket)
- door interlock (mandatory for ABB switchgear). This device prevents the circuit breaker from being racked into the switchgear when the switchgear door is open.



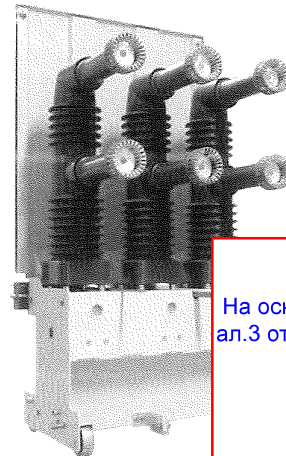
VD4 with poles in polyamide



VD4 - 36 kV



VD4 - up to 24 kV



VD4 - 36/40 kV in floor rolling version

На основании чл.36а ал.3 от ЗОП

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Selection and ordering

Withdrawable circuit breakers

Withdrawable circuit breakers
for PowerCube modules (12 kV) ⁽⁵⁾



Circuit breaker	VD4/P 12		VD4/W 12 ⁽⁵⁾					
	PowerCube module	PB1	PB2					
Standards	IEC 62271-100	*	*					
Rated voltage	Ur [kV]	12 ⁽⁴⁾	12					
Rated insulation voltage	Us [kV]	12	12					
Withstand voltage at 50 Hz	Ud (1 min) [kV]	28	28					
Impulse withstand voltage	Up [kV]	75	75					
Rated frequency	fr [Hz]	50-60	50-60					
Rated thermal current (40 °C) ⁽¹⁾	Ir [A]	630	1250	630	1250	1250	1250	
		16	16	16	16	—	—	
		20	20	20	20	—	—	
Rated breaking capacity (rated symmetrical short-circuit current)	Isc [kA]	25	25	25	25	—	—	
		31.5	31.5	31.5	31.5	—	—	
		—	—	—	—	40	—	
		—	—	—	—	—	50	
		—	—	—	—	—	—	
Admissible rated short-time withstand current (3s)	Ik [kA]	16	16	16	16	—	—	
		20	20	20	20	—	—	
		25	25	25	25	—	—	
		31.5	31.5	31.5	31.5	—	—	
		—	—	—	—	40	—	
Making capacity	Ip [kA]	—	—	—	—	—	50	
		40	40	40	40	—	—	
		50	50	50	50	—	—	
		63	63	63	63	—	—	
		80	80	80	80	—	—	
—	—	—	—	100	—			
—	—	—	—	—	125			
Operation sequence	[O - 0.3 s - CO - 15 s - CO]	*	*					
Opening time	[ms]	33 ... 60	33 ... 60		33 ... 60			
Arcing time	[ms]	10 ... 15	10 ... 15		10 ... 15			
Total breaking time	[ms]	43 ... 75	43 ... 75		43 ... 75			
Closing time	[ms]	30 ... 60	30 ... 60		30 ... 60			
Maximum overall dimensions		H [mm]	628	628	691	691	691	691
		W [mm]	503	503	653	853	653	691
		D [mm]	662	662	642	642	641	641
		Pole center distance P [mm]	150	150	210	210	210	210
Weight	[kg]	116	116	135	135	174	174	
Standardized dimensions table	TN	7412 ⁽³⁾	7412 ⁽³⁾	7420 ⁽³⁾	7420 ⁽³⁾	—	—	
	1VCD	—	—	—	—	60124	60124	
Operating temperature	[°C]	- 5 ... + 40	- 5 ... + 40					
Tropicalization	IEC: 60068-2-30, 60721-2-1	*	*					
Electromagnetic compatibility	IEC: 62271-1	*	*					

На основании чл.36а
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VD4/P 12					VD4/W 12			
PB2					PB3		PB3	
•					•		•	
12 (*)					12 (*)		12	
12					12		12	
28					28		28	
75					75		75	
50-60					50-60		50-60	
1600	1600	1600	2000	2000	2500	2500	3150 (*)	3150 (*)
—	—	—	—	—	—	—	—	—
20	—	—	20	—	20	—	20	—
25	—	—	25	—	25	—	25	—
31.5	—	—	31.5	—	31.5	—	31.5	—
—	40	—	40	—	40	—	40	—
—	—	50	—	50	—	50	—	50
—	—	—	—	—	—	—	—	—
20	—	—	20	—	20	—	20	—
25	—	—	25	—	25	—	25	—
31.5	—	—	31.5	—	31.5	—	31.5	—
—	40	—	40	—	40	—	40	—
—	—	50	—	50	—	50	—	50
—	—	—	—	—	—	—	—	—
50	—	—	50	—	50	—	50	—
63	—	—	63	—	63	—	63	—
80	—	—	80	—	80	—	80	—
—	100	—	100	—	100	—	100	—
—	—	125	—	125	—	125	—	125
•					•		•	
33 ... 60					33 ... 60		33 ... 60	
10 ... 15					10 ... 15		10 ... 15	
43 ... 75					43 ... 75		43 ... 75	
30 ... 60					30 ... 60		30 ... 60	
691	691	691	690	691	691	691	730	691
653	653	681	653	681	853	853	853	853
642	641	643	642	643	640	643	640	643
210	210	210	210	210	275	275	275	275
160	174	180	160	190	186	225	221	240
7415 (*)	—	—	7415 (*)	—	7417 (*)	—	—	—
—	003284 (*)	003444	—	003444	—	003445	000152 (*)	003596
- 5 ... + 40					- 5 ... + 40		- 5 ... + 40	
•					•		•	
•					•		•	

(*) Rated current guaranteed with circuit breaker installed in PowerCube enclosure and with 40 °C ambient temperature
 (†) Up to 4000 A with forced ventilation.
 (‡) Poles in polyamide
 (§) Available in 10 kV voltage version to GOST standards
 (¶) On request, the closing spring can be loaded by means of a removable crank handle outside the operating mechanism (instead of linear loading, only possible with the door open, by means of a lever built into the front of the

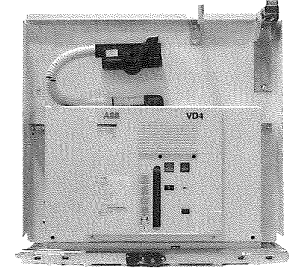
На основании чл.36а
 ал.3 от ЗОП

000003

Selection and ordering

Withdrawable circuit breakers

Withdrawable circuit breakers
for PowerCube modules (17.5 kV) (4)



Circuit breaker	VD4/P 17		VD4/W 17 (*)					
	PowerCube module	PB1	PB2					
Standards	IEC 62271-100	•	•					
Rated voltage	Ur [kV]	17.5	17.5					
Rated insulation voltage	Us [kV]	17.5	17.5					
Withstand voltage at 50 Hz	Ud (1 min) [kV]	38	38					
Impulse withstand voltage	Up [kV]	95	95					
Rated frequency	fr [Hz]	50-60	50-60					
Rated thermal current (40 °C) (1)	Ir [A]	630	1250	630	1250	1250	1250	
		16	16	16	16	—	—	
		20	20	20	20	—	—	
		25	25	25	25	—	—	
		31.5	31.5	31.5	31.5	—	—	
		—	—	—	—	40	—	
		—	—	—	—	—	50	
Rated breaking capacity (rated symmetrical short-circuit current)	Isc [kA]	16	16	16	16	—	—	
		20	20	20	20	—	—	
		25	25	25	25	—	—	
		31.5	31.5	31.5	31.5	—	—	
		—	—	—	—	40	—	
		—	—	—	—	—	50	
		—	—	—	—	—	—	
Admissible rated short-time withstand current (3s)	Ik [kA]	16	16	16	16	—	—	
		20	20	20	20	—	—	
		25	25	25	25	—	—	
		31.5	31.5	31.5	31.5	—	—	
		—	—	—	—	40	—	
		—	—	—	—	—	50	
		—	—	—	—	—	—	
Making capacity	Ip [kA]	40	40	40	40	—	—	
		50	50	50	50	—	—	
		63	63	63	63	—	—	
		80	80	80	80	—	—	
		—	—	—	—	100	—	
		—	—	—	—	—	125	
		—	—	—	—	—	—	
Operation sequence	[O - 0.3 s - CO - 15 s - CO]	•	•					
Opening time	[ms]	33 ... 60	33 ... 60					
Arcing time	[ms]	10 ... 15	10 ... 15					
Total breaking time	[ms]	43 ... 75	43 ... 75					
Closing time	[ms]	30 ... 60	30 ... 60					
Maximum overall dimensions		H [mm]	628	628	691	691	691	691
		W [mm]	503	503	653	653	653	653
		D [mm]	662	662	642	642	641	641
		Pole center distance P [mm]	150	150	210	210	210	210
		Weight	[kg]	116	116	135	135	174
Standardized dimensions table	TN	7412 (*)	7412 (*)	7420 (*)	7420 (*)	—	—	
	1VCD	—	—	—	—	60124	60124	
Operating temperature	[°C]	- 5 ... + 40	- 5 ... + 40					
Tropicalization	IEC: 60068-2-30, 60721-2-1	•	•					
Electromagnetic compatibility	IEC: 62271-1	•	•					

На основании чл.36а
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VD4/P 17					VD4/W 17				
PB2					PB3				
.					.				.
17.5					17.5				17.5
17.5					17.5				17.5
38					38				38
95					95				95
50-60					50-60				50-60
1600	1600	1600	2000	2000	2500	2500	3150 (²)	3150 (²)	
—	—	—	—	—	—	—	—	—	—
20	—	—	20	—	20	—	20	—	—
25	—	—	25	—	25	—	25	—	—
31.5	—	—	31.5	—	31.5	—	31.5	—	—
—	40	—	40	—	40	—	40	—	—
—	—	50	—	50	—	50	—	50	—
—	—	—	—	—	—	—	—	—	—
20	—	—	20	—	20	—	20	—	—
25	—	—	25	—	25	—	25	—	—
31.5	—	—	31.5	—	31.5	—	31.5	—	—
—	40	—	40	—	40	—	40	—	—
—	—	50	—	50	—	50	—	50	—
—	—	—	—	—	—	—	—	—	—
50	—	—	50	—	50	—	50	—	—
63	—	—	63	—	63	—	63	—	—
80	—	—	80	—	80	—	80	—	—
—	100	—	100	—	100	—	100	—	—
—	—	125	—	125	—	125	—	125	—
.					.				.
33 ... 60					33 ... 60				33 ... 60
10 ... 15					10 ... 15				10 ... 15
43 ... 75					43 ... 75				43 ... 75
30 ... 60					30 ... 60				30 ... 60
691	691	691	690	691	691	691	730	691	
653	653	681	653	681	853	853	853	853	
642	641	643	642	643	640	643	640	643	
210	210	210	210	210	275	275	275	275	
160	174	180	160	190	186	225	221	240	
7415 (³)	—	—	7415 (³)	—	7417 (³)	—	—	—	
—	003284 (²)	003444	—	003444	—	003445	000152 (²)	003596	
- 5 ... + 40					- 5 ... + 40				
.					.				.
.					.				.

(¹) Rated current guaranteed with circuit breaker installed in PowerCube enclosure and with 40 °C ambient temperature.
 (²) Up to 4000 A with forced ventilation.
 (³) Poles in polyamide.
 (⁴) On request, the closing spring can be loaded by means of a removable crank handle outside the operating mechanism (instead of linear loading, only possible with the door open, by means of a

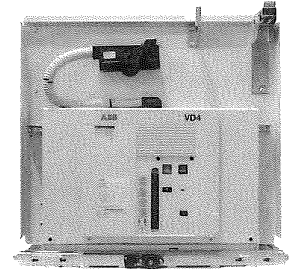
На основании чл.36а ал.3 от ЗОП

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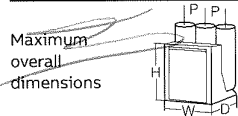
Selection and ordering

Withdrawable circuit breakers

Withdrawable circuit breakers
for PowerCube modules (24 kV) ⁽⁴⁾



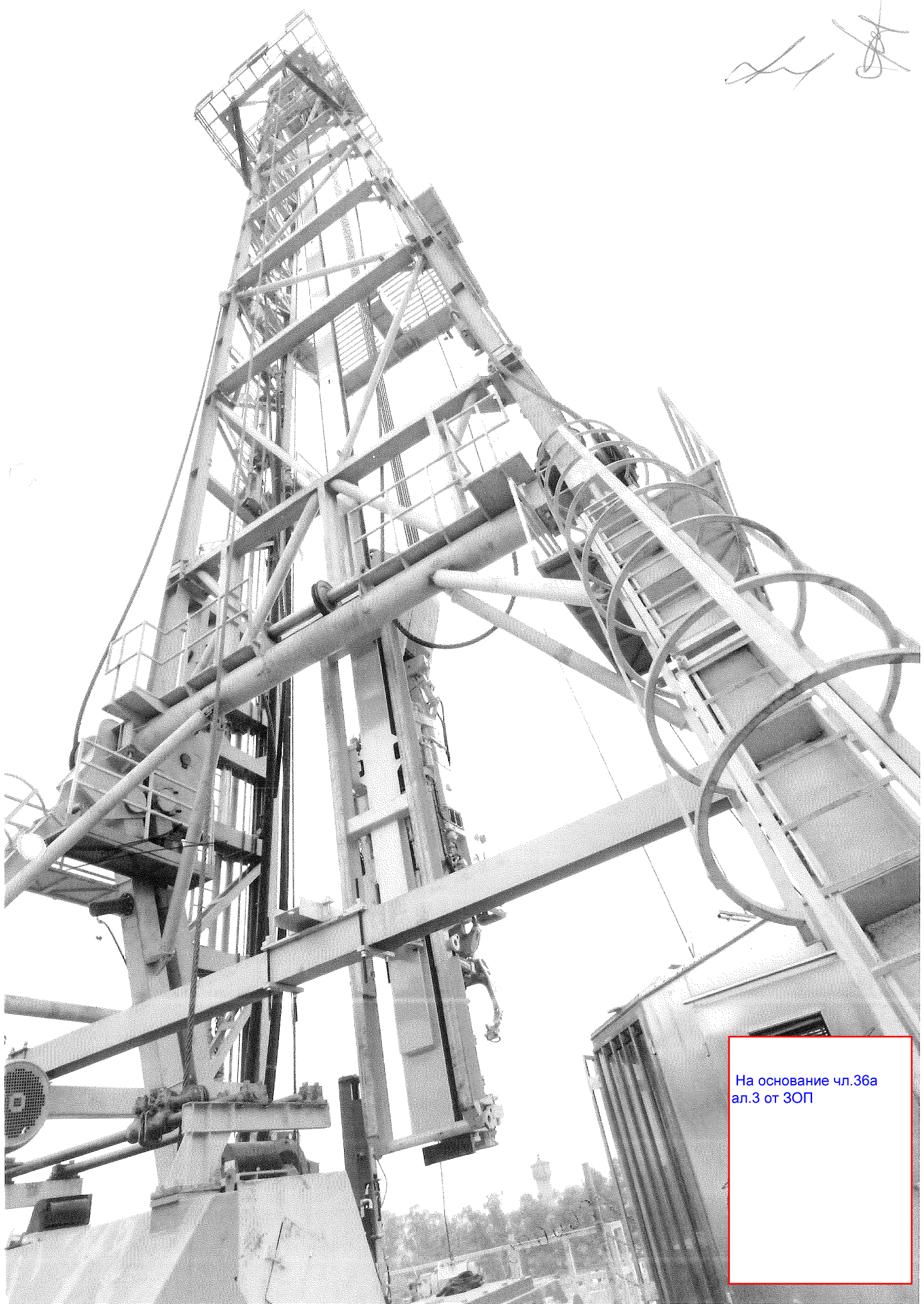
Circuit breaker	VD4/P 24					
	PowerCube module	PB4	PB5			
Standards	IEC 62271-100	•	•			
Rated voltage	Ur [kV]	24	24			
Rated insulation voltage	Us [kV]	24	24			
Withstand voltage at 50 Hz	Ud (1 min) [kV]	50	50			
Impulse withstand voltage	Up [kV]	125	125			
Rated frequency	fr [Hz]	50-60	50-60			
Rated thermal current (40 °C) ⁽¹⁾	Ir [A]	630	1250	1600	2000	2500 ⁽²⁾
	Isc [kA]	16	16	16	16	16
Rated breaking capacity (rated symmetrical short-circuit current)		20	20	20	20	20
		25	25	25	25	25
		–	31.5	31.5	31.5	31.5
Rated short-time withstand current (3s)	Ik [kA]	16	16	16	16	16
		20	20	20	20	20
		25	25	25	25	25
Making capacity		–	31.5	31.5	31.5	31.5
	I _p [kA]	40	40	40	40	40
		50	50	50	50	50
		63	63	63	63	63
		–	80	80	80	80
Operation sequence	[O - 0.3 s - CO - 15 s - CO]	•	•	•	•	•
Opening time	[ms]	33 ... 60	33 ... 60			
Arcing time	[ms]	10 ... 15	10 ... 15			
Total breaking time	[ms]	43 ... 75	43 ... 75			
Closing time	[ms]	30 ... 60	30 ... 60			
Maximum overall dimensions	H [mm]	794	794	838	838	838
	W [mm]	653	653	853	853	853
	D [mm]	802	802	790	790	790
	Pole center distance P [mm]	210	210	275	275	275
Weight	[kg]	140	140/146 ⁽³⁾	228	228	228
Standardized dimensions table	TN	7413	7413	7418	7418	7418
	1VCD	–	000173 ⁽³⁾	–	–	–
Operating temperature	[°C]	- 5 ... + 40				
Tropicalization	IEC: 60068-2-30, 60721-2-1	•				
Electromagnetic compatibility	IEC: 62271-1	•				



- (¹) Rated current guaranteed with circuit breaker installed in PowerCube enclosure and with 40 °C ambient temperature.
(²) 2300 A rated uninterrupted current guaranteed with natural ventilation; 2500 A rated uninterrupted current guaranteed with forced ventilation.
(³) 31.5 kA version.
(⁴) On request, the closing spring can be loaded by means of a removable crank handle outside the operating mechanism (instead of linear loading, only possible with the door open, by means of a lever built into the front of the operating mechanism).

На основании чл.36а
ап.3 от ЗОП

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На основание чл.36а
ал.3 от ЗОП

Selection and ordering

Withdrawable circuit breakers

Types of withdrawable circuit breakers available for PowerCube modules
Complete the circuit breaker selected with the optional accessories indicated on the following pages.

VD4 (12 kV) withdrawable circuit breaker

Ur	Isc	Rated thermal current (40 °C) [A]				Circuit breaker type
		W=650	W=750	W=750	W=1000	
kV	kA	P=150	P=210	P=210	P=275	
		u/l=205	u/l=310	u/l=310	u/l=310	
		ø=35	ø=35	ø=79	ø=109	
	16	630				VD4/P 12.06.16 p150
	20	630				VD4/P 12.06.20 p150
	25	630				VD4/P 12.06.25 p150
	31,5	630				VD4/P 12.06.32 p150
	16	1250				VD4/P 12.12.16 p150
	20	1250				VD4/P 12.12.20 p150
	25	1250				VD4/P 12.12.25 p150
	31,5	1250				VD4/P 12.12.32 p150
	16		630			VD4/W 12.06.16 p210
	20		630			VD4/W 12.06.20 p210
	25		630			VD4/W 12.06.25 p210
	31,5		630			VD4/W 12.06.32 p210
	16		1250			VD4/W 12.12.16 p210
	20		1250			VD4/W 12.12.20 p210
	25		1250			VD4/W 12.12.25 p210
	31,5		1250			VD4/W 12.12.32 p210
	40		1250			VD4/W 12.12.40 p210
	40			1250		VD4/P 12.12.40 p210
	50			1250		VD4/P 12.12.50 p210
12	20			1600		VD4/P 12.16.20 p210
	25			1600		VD4/P 12.16.25 p210
	31,5			1600		VD4/P 12.16.32 p210
	40			1600		VD4/P 12.16.40 p210
	50			1600		VD4/P 12.16.50 p210
	20			2000		VD4/P 12.20.20 p210
	25			2000		VD4/P 12.20.25 p210
	31,5			2000		VD4/P 12.20.32 p210
	40			2000		VD4/P 12.20.40 p210
	50			2000		VD4/P 12.20.50 p210
	20				2500	VD4/P 12.25.20 p275
	25				2500	VD4/P 12.25.25 p275
	31,5				2500	VD4/P 12.25.32 p275
	40				2500	VD4/P 12.25.40 p275
	50				2500	VD4/P 12.25.50 p275
	20				3150 (*)	VD4/W
	25				3150 (*)	VD4/W
	31,5				3150 (*)	VD4/W
	40				3150 (*)	VD4/W
	50				3150 (*)	VD4/W

W = Enclosure width.
P = Horizontal center distance of poles
u/l = Distance between bottom and top terminal
ø = Diameter of isolating contact.
(*) Up to 4000 A with forced ventilation.

На основании чл.36а
ап.3 от ЗОП

000003

VD4 (17.5 kV) withdrawable circuit breaker

Ur	Isc	Rated thermal current (40 °C) [A]				Circuit breaker type
		W=650	W=750	W=750	W=1000	
kV	kA	P=150	P=210	P=210	P=275	
		u/l=205	u/l=310	u/l=310	u/l=310	
		ø=35	ø=35	ø=79	ø=109	
17.5	16	630				VD4/P 17.06.16 p150
	20	630				VD4/P 17.06.20 p150
	25	630				VD4/P 17.06.25 p150
	31.5	630				VD4/P 17.06.32 p150
	16	1250				VD4/P 17.12.16 p150
	20	1250				VD4/P 17.12.20 p150
	25	1250				VD4/P 17.12.25 p150
	31.5	1250				VD4/P 17.12.32 p150
	16		630			VD4/W 17.06.16 p210
	20		630			VD4/W 17.06.20 p210
	25		630			VD4/W 17.06.25 p210
	31.5		630			VD4/W 17.06.32 p210
	16		1250			VD4/W 17.12.16 p210
	20		1250			VD4/W 17.12.20 p210
	25		1250			VD4/W 17.12.25 p210
	31.5		1250			VD4/W 17.12.32 p210
	40			1250		VD4/P 17.12.40 p210
	50			1250		VD4/P 17.12.50 p210
	20			1600		VD4/P 17.16.20 p210
	25			1600		VD4/P 17.16.25 p210
	31.5			1600		VD4/P 17.16.32 p210
	40			1600		VD4/P 17.16.40 p210
	50			1600		VD4/P 17.16.50 p210
	20			2000		VD4/P 17.20.20 p210
	25			2000		VD4/P 17.20.25 p210
	31.5			2000		VD4/P 17.20.32 p210
	40			2000		VD4/P 17.20.40 p210
	50			2000		VD4/P 17.20.50 p210
	20				2500	VD4/P 17.25.20 p275
	25				2500	VD4/P 17.25.25 p275
	31.5				2500	VD4/P 17.25.32 p275
40				2500	VD4/P 17.25.40 p275	
50				2500	VD4/P 17.25.50 p275	
20					3150 (†)	
25					3150 (†)	
31.5					3150 (†)	
40					3150 (†)	
50					3150 (†)	

W = Enclosure width.
 P = Horizontal center distance of poles.
 u/l = Distance between bottom and top terminals.
 ø = Diameter of isolating contact.
 (†) Up to 4000 A with forced ventilation.

На основании чл.36а
 ал.3 от ЗОП

020001

Selection and ordering

Withdrawable circuit breakers

VD4 (24 kV) withdrawable circuit breaker

Ur	Isc	Rated thermal current (40 °C) [A]		Circuit breaker type
		W=800	W=1000	
kV	kA	P=210	P=275	
		u/l=310	u/l=310	
		ø=35	ø=79	
24	16	630		VD4/P 24.06.16 p210
	20	630		VD4/P 24.06.20 p210
	25	630		VD4/P 24.06.25 p210
	16	1250		VD4/P 24.12.16 p210
	20	1250		VD4/P 24.12.20 p210
	25	1250		VD4/P 24.12.25 p210
	31.5	1250		VD4/P 24.12.32 p210
	16		1600	VD4/P 24.16.16 p275
	20		1600	VD4/P 24.16.20 p275
	25		1600	VD4/P 24.16.25 p275
	31.5		1600	VD4/P 24.16.32 p275
	16		2000	VD4/P 24.20.16 p275
	20		2000	VD4/P 24.20.20 p275
	25		2000	VD4/P 24.20.25 p275
	31.5		2000	VD4/P 24.20.32 p275
	16		2300 (*)	VD4/P 24.25.16 p275
	20		2300 (*)	VD4/P 24.25.20 p275
	25		2300 (*)	VD4/P 24.25.25 p275
	31.5		2300 (*)	VD4/P 24.25.32 p275

W = Enclosure width.

P = Horizontal center distance of poles.

u/l = Distance between bottom and top terminals.

ø = Diameter of isolating contact.

(*) Up to 2500 A rated current guaranteed with forced ventilation.

На основании чл.36а
ал.3 от ЗОП

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Standard equipment of withdrawable circuit breakers for PowerCube modules

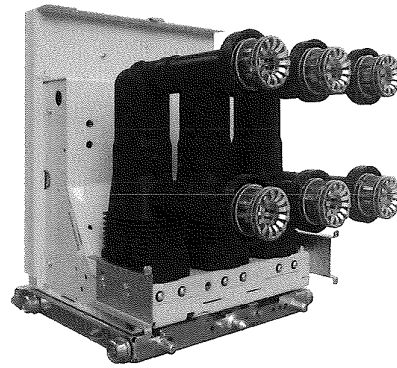
The basic versions of the withdrawable circuit

breakers are always three-pole and equipped with:

- EL manual operating mechanism
- mechanical signaling device for closing springs loaded/discharged
- mechanical signaling device for circuit breaker open/closed
- closing pushbutton
- opening pushbutton
- operation counter
- set of ten circuit breaker open/closed auxiliary contacts

Note: three break contacts (signaling circuit breaker open) and four make contacts (signaling circuit breaker closed) are available with the group of ten auxiliary contacts supplied as standard and the maximum number of electrical applications.

- lever built into the operating mechanism for linear loading of closing spring
- isolating contacts
- cord with connector (plug only) for auxiliary circuits, with striker pins which prevent the plug from being inserted into the socket if the rated current of the circuit breaker is different from the rated current of the switchgear
- racking-in/out lever (the quantity depends on the number of apparatuses ordered)
- locking electromagnet in the truck. This prevents the circuit breaker from being racked into the switchgear when the auxiliary circuits are not connected (plug not in in the socket).
- door interlock (mandatory for ABB switchgear); this device prevents the circuit breaker from being racked into the switchgear when the switchgear door is open.



На основание чл.36а
ал.3 от ЗОП

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Selection and ordering

Withdrawable circuit breakers

Withdrawable circuit breakers for ZS8.4 switchgear (12 - 17.5 - 24 kV)



Circuit breaker	VD4/Z8						
	Panel without partitions	•					
	Panel with partitions	—					
	Preussen Elektra - EON (?)	—					
	Width [mm]	650	650	650	650	800	800
	Depth [mm]	1000	1000	1000	1000	1200	1200
Standards	IEC 62271-100	•					
Rated voltage	Ur [kV]	12	12	17.5	17.5	24	24
Rated insulation voltage	Us [kV]	12	12	17.5	17.5	24	24
Withstand voltage at 50 Hz	Ud (1 min) [kV]	28	28	38	38	50	50
Impulse withstand voltage	Up [kV]	75	75	95	95	125	125
Rated frequency	fr [Hz]	50-60					
Rated thermal current (40 °C) (1)	Ir [A]	630	1250	630	1250	630	1250
Rated breaking capacity (rated symmetrical short-circuit current)	Isc [kA]	—	—	—	—	16	16
		20	20	20	20	20	20
Admissible rated short-time withstand current(3 s)	Ik [kA]	25	25	25	25	25	25
		—	—	—	—	16	16
Making capacity	Ip [kA]	20	20	20	20	20	20
		25	25	25	25	25	25
		—	—	—	—	40	40
		50	50	50	50	50	50
		63	63	63	63	63	63
Operation sequence	[O-0.3s-CO-15s-CO]	•					
Opening time	[ms]	33...60					
Arcing time	[ms]	10...15					
Total breaking time	[ms]	43...75					
Closing time	[ms]	30...60					
Maximum overall dimensions	H [mm]	579	579	579	579	680	680
	W [mm]	503	503	503	503	653	653
	D [mm]	548	548	548	548	646	646
	Pole center distance P [mm]	150	150	150	150	210	210
Weight	[kg]	116	116	116	116	140	140
Standardized dimensions table	1VCD	000092	000137	000137	000137	000089	000138
Operating temperature	[°C]	- 5 ... + 40					
Tropicalization	IEC 60068-2-30	•					
	IEC 60721-2-1	•					
Electromagnetic compatibility	IEC 62271-1	•					

(1) Rated current guaranteed with circuit breaker installed in switchgear with 40 °C air temperature.

(?) Special type with device for loading the closing spring by means of a crank handle outside the operating mechanism.

На основании чл.36а
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VD4/ZT8						VD4/ZS8			
—						—			
•						—			
—						•			
650	650	650	650	800	800	650	650	800	800
1200	1200	1200	1200	1200	1200	1200	1200	1200	1200
•						•			
12	12	17.5	17.5	24	24	12	12	24	24
12	12	17.5	17.5	24	24	12	12	24	24
28	28	38	38	50	50	28	28	50	50
75	75	95	95	125	125	75	75	125	125
50-60						50-60			
630	1250	630	1250	630	1250	630	1250	630	1250
—	—	—	—	16	16	—	—	16	16
20	20	20	20	20	20	20	20	20	20
25	25	25	25	25	25	25	25	25	25
—	—	—	—	16	16	—	—	16	16
20	20	20	20	20	20	20	20	20	20
25	25	25	25	25	25	25	25	25	25
—	—	—	—	40	40	—	—	40	40
50	50	50	50	50	50	50	50	50	50
63	63	63	63	63	63	63	63	63	63
•						•			
33...60						33...60			
10...15						10...15			
43...75						43...75			
30...60						30...60			
579	579	579	579	680	680	579	579	680	680
503	503	503	503	653	653	503	503	653	653
638	638	638	638	646	646	638	638	646	646
150	150	150	150	210	210	150	150	210	210
116	116	116	116	140	140	116	116	140	140
000093	000134	000134	000134	000090	000136	000091	000133	000088	000135
- 5 ... + 40						- 5 ... + 40			
•						•			
•						•			
•						•			

На основании чл.36а
ал.3 от ЗОП

000003

Selection and ordering

Withdrawable circuit breakers

VD4/ZS8 - VD4/ZT8 - VD4/Z8 withdrawable circuit breakers for ZS8.4 switchgear

Ur	Isc	Rated uninterrupted current (40°C) [A]						Circuit breaker type	
		Panel without partition		Panel with partition		Special EON panel			
		W = 650	W = 800	W = 650	W = 800	W = 650	W = 800		
		P = 150	P = 210	P = 150	P = 210	P = 150	P = 210		
kV	kA	u/l = 205	u/l = 310	u/l = 205	u/l = 310	u/l = 205	u/l = 310		
		ø = 35	ø = 35	ø = 35	ø = 35	ø = 35	ø = 35		
12	20	630						VD4/Z8 12.06.20 p150	
	25	630						VD4/Z8 12.06.25 p150	
	20	1250						VD4/Z8 12.12.20 p150	
	25	1250						VD4/Z8 12.12.25 p150	
	20			630				VD4/ZT8 12.06.20 p150	
	25			630				VD4/ZT8 12.06.25 p150	
	20			1250				VD4/ZT8 12.12.20 p150	
	25			1250				VD4/ZT8 12.12.25 p150	
	20					630		VD4/ZS8 12.06.20 p150	
	25					630		VD4/ZS8 12.06.25 p150	
	20					1250		VD4/ZS8 12.12.20 p150	
	25					1250		VD4/ZS8 12.12.25 p150	
	17.5	20	630						VD4/Z8 17.06.20 p150
		25	630						VD4/Z8 17.06.25 p150
		20	1250						VD4/Z8 17.12.20 p150
		25	1250						VD4/Z8 17.12.25 p150
20				630				VD4/ZT8 17.06.20 p150	
25				630				VD4/ZT8 17.06.25 p150	
20				1250				VD4/ZT8 17.12.20 p150	
25				1250				VD4/ZT8 17.12.25 p150	
24	16	630						VD4/Z8 24.06.16 p210	
	20	630						VD4/Z8 24.06.20 p210	
	25	630						VD4/Z8 24.06.25 p210	
	16	1250						VD4/Z8 24.12.16 p210	
	20	1250						VD4/Z8 24.12.20 p210	
	25	1250						VD4/Z8 24.12.25 p210	
	16			630				VD4/ZT8 24.06.16 p210	
	20			630				VD4/ZT8 24.06.20 p210	
	25			630				VD4/ZT8 24.06.25 p210	
	16			1250				VD4/ZT8 24.12.16 p210	
	20			1250				VD4/ZT8 24.12.20 p210	
	25			1250				VD4/ZT8 24.12.25 p210	
24	16					630		VD4/ZS8 24.06.16 p210	
	20					630		VD4/ZS8 24.06.20 p210	
	25					630		VD4/ZS8 24.06.25 p210	
	16					1250		VD4/ZS8 24.12.16 p210	
	20					1250		VD4/ZS8 24.12.20 p210	
	25					1250		VD4/ZS8 24.12.25 p210	

W = Switchgear width.
P = Horizontal center distance of poles.
u/l = Distance between bottom and top terminals.
ø = Diameter of isolating contact.

На основании чл.36а
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Standard equipment of withdrawable circuit breakers for ZS8.4 switchgear

The basic versions of the withdrawable circuit breakers are three-pole and equipped with:

- EL manual operating mechanism
- mechanical signaling device for closing springs loaded/discharged
- mechanical signaling device for circuit breaker open/closed
- closing pushbutton
- opening pushbutton
- operation counter
- set of ten circuit breaker open/closed auxiliary contacts

Note: three break contacts (signaling circuit breaker open) and four make contacts (signaling circuit breaker closed) are available with the group of ten auxiliary contacts supplied as standard and the maximum number of electrical applications.

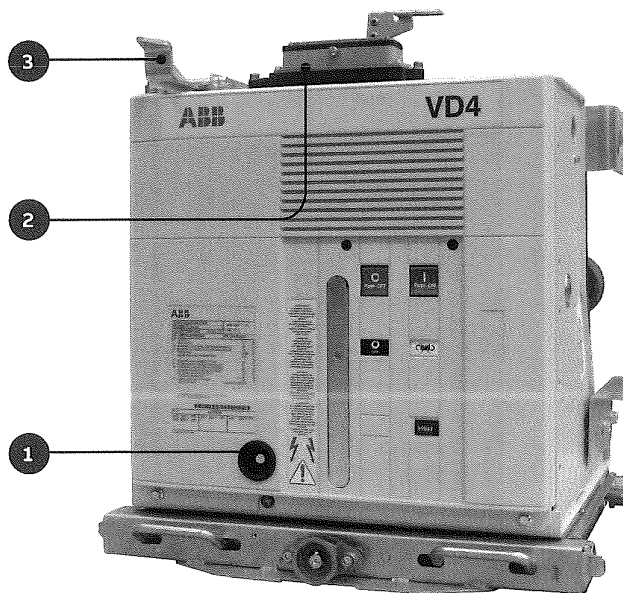
- lever built into the operating mechanism for linear loading of closing spring for VD4/Z8 and VD4/ZT8, external with crank operation for VD4/ZS8
- racking in/out lever (the quantity depends on the number of apparatuses ordered)

VD4/ZS8

- device for loading the closing springs with the door closed, by means of a removable crank handle outside the operating mechanism and the switchgear
- Harting 64-pin socket with mechanical interlock which prevents the circuit breaker from being moved when the plug is not in the socket
- door interlock, which prevents the spring loading lever from being inserted when the circuit breaker is closed
- door interlock and Harting 64-pin socket, which prevent the door from closing when the plug is not in the socket.

VD4/Z8 - VD4/ZT8

- Harting 64-pin socket with mechanical interlock which prevents the circuit breaker from being moved when the plug is not in the socket.



Key

- 1) Device with crank handle for loading closing spring (only version VD4/ZS8)
- 2) Harting 64 plus socket with mechanical interlock which prevents circuit breaker from being moved when the plug is not inserted
- 3) Interlock that prevents closing if plug is not in the socket (only version VD4/ZS8)

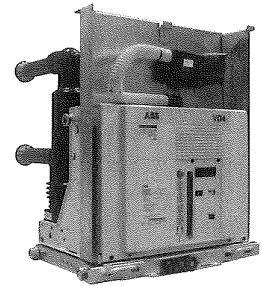
На основании чл.36а
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Selection and ordering

Withdrawable circuit breakers

General characteristics of withdrawable circuit breakers for UniSec switchgear (units WBC and WBS)



Circuit breaker		VD4/P 12	VD4/P 17	VD4/SEC			
Standards	IEC 62271-100	•	•	•			
Rated voltage	Ur [kV]	12	17.5	24			
Rated insulation voltage	Us [kV]	12	17.5	24			
Withstand voltage at 50 Hz	Ud (1 min) [kV]	28	38	50			
Impulse withstand voltage	Up [kV]	75	95	125			
Rated frequency	fr [Hz]	50-60	50-60	50-60			
Rated thermal current (40 °C) (1)	Ir [A]	630	1250	630	1250		
		630	1250	630	1250		
Rated breaking capacity (rated symmetrical short-circuit current)	Isc [kA]	16	16	16	16		
		20	20	20	20		
		25	25	25	25		
Admissible rated short-time withstand current (3 s)	Ik [kA]	16	16	16	16		
		20	20	20	20		
		25	25	25	25		
Making capacity	Ip [kA]	40	40	40	40		
		50	50	50	50		
Operation sequence	[O - 0.3 s - CO - 15 s - CO]	•	•	•			
Opening time	[ms]	33 ... 60	33 ... 60	33 ... 60			
Arcing time	[ms]	10 ... 15	10 ... 15	10 ... 15			
Total breaking time	[ms]	43 ... 75	43 ... 75	43 ... 75			
Closing time	[ms]	30 ... 60	30 ... 60	30 ... 60			
Maximum overall dimensions		H [mm]	628	628	632	632	743
		W [mm]	503	503	503	503	653
		D [mm]	662	662	664	664	742
		Pole center distance P [mm]	150	150	150	150	210
Weight	[kg]	116	116	116	116	133	
Standardized dimensions table	1VCD	7412 (2)	7412 (2)	7412 (2)	7412 (2)	000190	
Operating temperature	[°C]	- 5 ... + 40	- 5 ... + 40	- 5 ... + 40	- 5 ... + 40	- 5 ... + 40	
Tropicalization	IEC: 60068-2-30, 60721-2-1	•	•	•	•	•	
Electromagnetic compatibility	IEC 62271	•	•	•	•	•	

(1) Rated current guaranteed with withdrawable circuit breaker installed in switchgear with 40 °C ambient temperature.

(2) Poles in polyamide.

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Withdrawable circuit breaker for UniSec switchgear

Ur	Isc	Rated uninterrupted current (40 °C) [A]			Circuit breaker type
		P=150	P=150	P=210	
kV	kA	u/l=205	u/l=205	u/l=310	
		ø=35	ø=35	ø=79	
		12	16	630	
20	630				VD4/P 12.06.20 p150
25	630				VD4/P 12.06.25 p150
16	1250				VD4/P 12.12.16 p150
20	1250				VD4/P 12.12.20 p150
25	1250				VD4/P 12.12.25 p150
17	16		630		VD4/P 17.06.16 p150
	20		630		VD4/P 17.06.20 p150
	25		630		VD4/P 17.06.25 p150
	16		1250		VD4/P 17.12.16 p150
	20		1250		VD4/P 17.12.20 p150
	25		1250		VD4/P 17.12.25 p150
24	16			630	VD4/SEC 24.06.16 p210
	20			630	VD4/SEC 24.06.20 p210
	25			630	VD4/SEC 24.06.25 p210
	16			1250	VD4/SEC 24.12.16 p210
	20			1250	VD4/SEC 24.12.20 p210
	25			1250	VD4/SEC 24.12.25 p210

P = Horizontal center distance between poles.
u/l = Distance between top and bottom terminals.
ø = Diameter of isolating contacts.

Standard equipment of withdrawable circuit breakers for UniSec switchgear

The basic versions of the withdrawable circuit breakers are three-pole and equipped with:

- EL manual operating mechanism
- mechanical signaling device for closing springs loaded/discharged
- mechanical signaling device for circuit breaker open/closed
- closing pushbutton
- opening pushbutton
- operation counter
- set of ten circuit breaker open/closed auxiliary contacts

Note: three break contacts (signaling circuit breaker open) and four make contacts (signaling circuit breaker closed) are available with the group of ten auxiliary contacts supplied as standard and the maximum number of electrical applications.

- lever built into the operating mechanism for linear loading of closing spring
- isolating contacts
- cord with connector (plug only) for auxiliary circuits, with striker pins which prevent the plug from being inserted into the socket if the rated current of the circuit breaker is different from the rated current of the switchgear
- racking-in/out lever (the quantity depends on apparatuses ordered)

На основании чл.36а
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Selection and ordering

Optional accessories

For circuit breakers up to 36 kV, 50 kA with EL operating mechanism

Accessories with the same number are alternative to each other.

1 Shunt opening release (-MBO1)

Allows the opening command of the apparatus to be enabled by remote control.

This release is suitable for both instantaneous and permanent duty. However, there is always an auxiliary contact, -BGB1, that de-energizes it after the circuit breaker has opened. In the case of instantaneous service, the current impulse must last at least 100 ms.

This release can be controlled by the following devices: coil continuity control (CCC), opening circuit supervision (TCS)(*) (**) or the ABB STU functionality control device (see accessory 21, supplied on request).

Characteristics	
Un	24-30-48-60-110...132-220...250 V DC
Un	48-60-110...127-220...250 V AC 50-60 Hz
Operating limits	65 ... 120% Un
Inrush power (Ps)	60...100 W / VA
Continuous power consumption (Pc)	1.5 W
Electronics self-consumption (no coil supplied); value independent of voltage applied	1.5 mA
Opening time	33...60 ms
Insulation voltage	2000 V 50 Hz (for 1 min)

(*) The minimum current that the relay with TCS function (used for monitoring coil continuity) detects as a condition denoting that the trip circuit is operating correctly (specified for each relay in the relative manual), must be sensibly higher than the self-consumption current of the actual coil (~1.5 mA).

If this fails to occur, always add, in parallel to the TCS, a circuit able to absorb sufficient current to compensate the gap while preventing the total current in the TCS circuit from rising above the maximum threshold (Itcs < 10 mA for High Voltage coils - from 110V to 250V, and Itcs < 50 mA for Low Voltage coils from 24 V to 60 V).

A simple resistor can be sized for the purpose, depending on the parameters of the TCS and the auxiliary voltage range used.

For further details consult the Guidelines for use of the Smart Coil 1VCD601416

(**) Consult ABB for shunt opening releases with admissible maximum TCS current up to 100 mA



2 Additional shunt opening release (-MBO2)

Similarly to shunt opening release -MBO1, this allows the opening command of the apparatus to be transmitted by remote control. It can be supplied by the same circuit as main shunt opening release -MBO1 or by a circuit that is completely separate from release -MBO1.

This release is suitable for both instantaneous and permanent duty. However, there is always an auxiliary contact, -BGB1, that de-energizes it after the circuit breaker has opened.

To guarantee the release action, the current impulse must last at least 100 ms.

Continuity functionality can be checked with a continuity control device (CCC), opening circuit supervision (TCS)(*) or the STU functionality control device (see accessory 21, supplied on request).

-MBO2 has the same electrical and operating characteristics as release -MBO1.



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3 Opening solenoid (-MBO3)

The opening solenoid (-MBO3) is a special demagnetization release to be used in conjunction with an overcurrent protection relay of the self-supplied type.

It is situated in the operating mechanism (in the left side) and is not an alternative to the additional shunt opening release (-MBO2).

It is not available for 40 and 50 kA circuit breakers.

Should this accessory be required, specify at the time of order since it cannot be installed later on by the customer.

Note: ask ABB for info for use in conjunction with the protection relay.

The opening solenoid (-MBO3) is available in two versions:

- For DC (release by discharging the energy stored in protection relay against overcurrents of the self-supplied type)
- For AC (release by means of the energy supplied by an summation current transformer on the secondaries of the protection current transformers (the transformer is at customer's charge)

4 Shunt closing release (-MBC)

Allows the closing command of apparatus to be transmitted by remote control.

This release is suitable for both instantaneous and permanent duty. An auxiliary contact that de-energizes it after the circuit breaker has closed is not envisaged.

The permanently supplied release provides the electrical anti-pumping function with both electrical opening and re-closing commands maintained. To guarantee the closing action, the current impulse must last at least 100 ms. If there is the same supply voltage for shunt closing release -MBC and under-voltage release -MBU and the circuit breaker must close automatically when auxiliary voltage returns, there must be a delay of at least 50 ms between under-voltage release energizing and energizing of the shunt closing release to allow the closing operation to take place. Continuity functionality can be checked with a continuity control device (CCC), opening circuit supervision (TCS)(*) (**) or the STU functionality control device (see accessory 21, supplied on request).

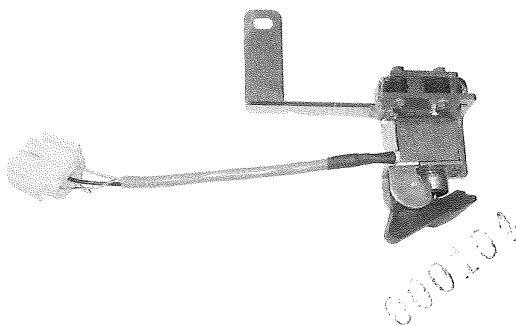
(*) The minimum current that the relay with TCS function (used for monitoring coil continuity) detects as a condition denoting that the trip circuit is operating correctly (specified for each relay in the relative manual), must be sensibly higher than the current consumption of the actual coil (~1.5 mA).

If this fails to occur, always add, in parallel to the TCS, a circuit able to absorb sufficient current to compensate the gap while preventing the total current in the TCS circuit from rising above the maximum threshold (Itcs < 10 mA for high voltage coils - from 110V to 250V, and Itcs < 50 mA for Low Voltage coils from 24 V to 60 V).

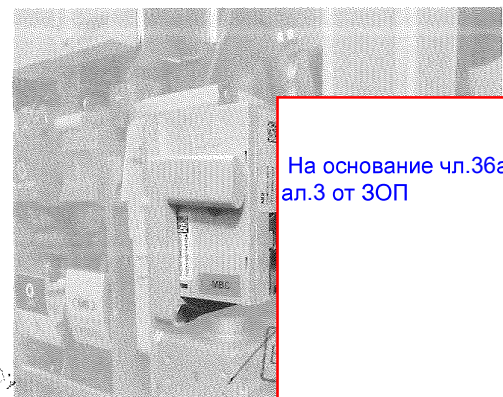
A simple resistor can be sized for the purpose, depending on the parameters of the TCS and the auxiliary voltage range used.

For further details, consult the Guidelines for use of the Smart Coil IVCD601416

(**) Consult ABB for shunt opening releases with admissible maximum TCS current up to 100 mA



Characteristics	
Un	24-30-48-60-110...132-220...250 V DC
Un	48-60-110...127-220...250 V AC 50-60 Hz
Operating limits	65 ... 120% Un
Inrush power (Ps)	60...100 W / VA
Continuous power consumption (Pc)	1.5 W
Electronics self-consumption (no coil supplied; value independent of voltage applied)	1.5 mA
Closing time	30...60 ms
Insulation voltage	2000 V 50 Hz (for 1 min)



На основании чл.36а ал.3 от ЗОП

Selection and ordering

Optional accessories

5 Undervoltage release (-MBU)

The undervoltage release opens the circuit breaker when there is a sensible reduction or lack of the voltage that powers it. The circuit breaker can only close when the release is energized (the closing lock is obtained mechanically).

It can be used for remote release (by means of a pushbutton of the normally closed type) and for locking on automatic closing/opening in the absence of voltage in the auxiliary circuits. Supplied by means of the secondary output of a voltage transformer, it provides locking upon automatic closing/opening in the absence of voltage in the Medium Voltage main circuit. If there is the same supply voltage for shunt closing release -MBC and undervoltage release -MBU and the circuit breaker must close automatically when auxiliary voltage returns, there must be a delay of at least 50 ms between undervoltage release energizing and energizing of the shunt closing release to allow the closing operation to take place.

The undervoltage release is available in the following versions:

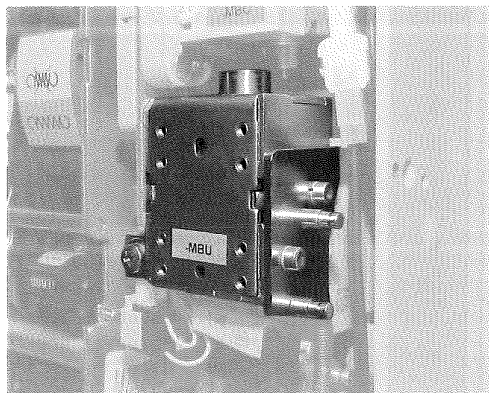
- 5A** Undervoltage release (with supply shunted from a transformer on the supply side of the circuit breaker or from an auxiliary power supply, regardless of the state in which the circuit breaker is to be found).
- 5B** Undervoltage release with -KFT electronic time-lag device (0.5 - 1 - 1.5 - 2 - 3 s) (with power supply as indicated for 5A); this device is supplied with a 0.5 s setting (the adjustments are described in the Circuit diagrams chapter)

Characteristics	
Un	24-30-48-60-110...132-220...250 V DC
Un	48-60-110...127-220...250 V AC 50-60 Hz
Operating limits	- circuit breaker opening: 35-70% Un
	- circuit breaker closing: 85-110% Un
Inrush power (Ps)	150 W / VA
Continuous power consumption (Pc)	1.55 W
Electronics self-consumption (no coil supplied); value independent of voltage applied	1.5 mA
Insulation voltage	2000 V 50 Hz (for 1 min)

Note

As an alternative to the undervoltage release, an additional shunt opening release (-MBO4) with the same electrical and operating specifications as shunt opening release (-MBO1) can be installed on request (only for 12...17.5 kV circuit breakers up to 40 kA and 24 kV up to 31.5 kA).

Warning! Since installation of the additional shunt opening release (-MBO4) requires a special mounting plate for releases, ask for application (-MBO4) when ordering and not after delivery.



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5C Electronic time-lag device (-KFT)

The electronic time-lag device must be installed outside the circuit breaker. It allows release tripping to be delayed by preset and adjustable times.

Use of the undervoltage release is recommended for the purpose of preventing trips when the power supply network of the release may be subject to interruptions or voltage drops of short duration.

If it is not being energized, circuit breaker closing is inhibited.

The time-lag device must be used in conjunction with an undervoltage release for d.c.

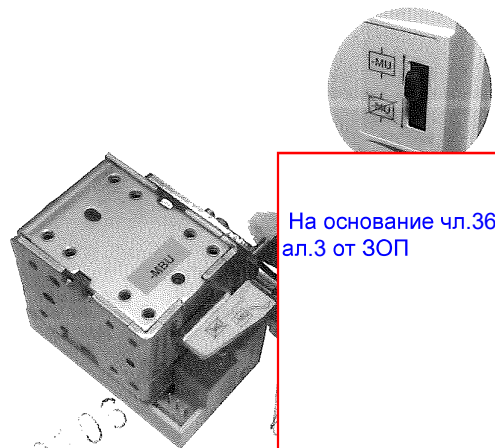
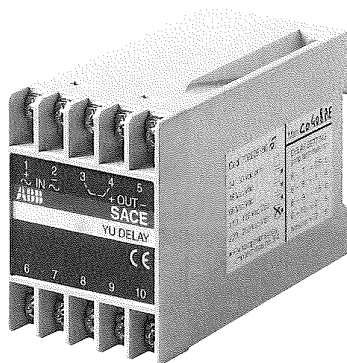
The voltage of the undervoltage release must be within the operating range of the electronic time-lag device.

Characteristics of the time-lag device	
Un	24...30 - 48 - 60 - 110...127 - 220...250 V~
Un	48 - 60 - 110...127 - 220...240 - V~ 50/60 Hz
Adjustable opening time (release + time-lag device): 0.5-1-1.5-2-3 s	

6 Mechanical override of the undervoltage release

This is a mechanical device which allows the undervoltage release trip to be temporarily excluded.

It is always equipped with electrical signaling. If this accessory is required, it must be specified at the time of order since it cannot be installed later on by the customer.



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Selection and ordering

Optional accessories

7a Auxiliary contacts of the circuit breaker (-BGB1) for 12 to 24 kV versions

Electrical signaling of circuit breaker open/closed can be obtained with a group of 10, 16, 20 or 24 auxiliary contacts for the fixed version and 10 or 16 auxiliary contacts for the withdrawable version. The standard equipment comprises 10 auxiliary contacts.

Note

The following are available using the standard group of ten auxiliary contacts and the maximum number of electrical accessories:

- for fixed circuit breakers: three closing contacts "a" for signaling circuit breaker open and five opening contacts "b" for signaling circuit breaker closed;
- for withdrawable circuit breakers: three closing contacts "a" for signaling circuit breaker open and four opening contacts "b" for signalling circuit breaker closed.

Circuit breakers in the fixed version are available with two finishing accessories (to be specified when ordering):

- non-wired auxiliary contacts; wiring to the terminals of the contacts is at the customer's charge (photo at left; the terminal box to which the other electrical accessories are wired is at the top); ask for instructions 1VCD601204 (available in the main languages) which describe how to remove, wire the auxiliary contacts more easily and fit the auxiliary contact unit back into its housing;
- auxiliary contacts already wired to the terminal box (see photo at right)

Consult circuit diagrams 1VCD400151 for fixed circuit breakers and 1VCD400155 for withdrawable circuit breakers.

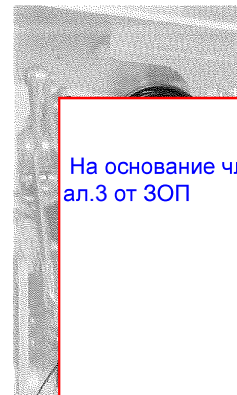
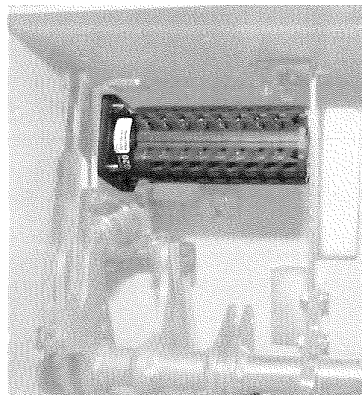
Note: The main shunt opening release and/or the additional shunt opening release use 1 and/or 2 closing contacts "a", thereby reducing the number of auxiliary contacts available. Always check the maximum number of contacts available with non-standard equipment.

The new diagrams are interchangeable with the existing ones, with the following exceptions:

- diagram 1VCD400151 (substitutes 1VCD400046 and 1VCD400099)
 - fig. 34 on the previous diagrams is represented by fig. 31 + fig. 32 on the new diagram;
 - fig. 33 and fig. 35 on the previous diagrams are not available with the new layout
- diagram 1VCD400155 (substitutes 1VCD400047)

Auxiliary contacts -BGB1 conform to the following standards/regulations/directives:

- IEC 62271-100
- IEEE C37.54
- EN 61373 cat. 1 class B / impact and vibration test
- Germanish Loyd regulation / vibrations envisaged by the shipping registers
- UL 508
- EN 60947 (DC-21A DC-22A DC-23A AC-21A)
- RoHS Directive



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General characteristics	
Insulation voltage to standard VDE 0110, Group C	660 V AC 800 V DC
Rated voltage	24 V ... 660 V
Test voltage	2 kV for 1 min
Maximum rated current	10 A - 50/60 Hz
Breaking capacity	Class 1 (IEC 62271-1)
Number of contacts	5
Groups of contacts	10 / 16 / 20
Contact travel	90°
Actuating force	0.66 Nm
Resistance	<6.5 mΩ
Storage temperature	-30 °C ... +120 °C
Operating temperature	-20 °C ... +70 °C (-30° ref. ANSI 37.09)
Contact overtemperature	10 K
Mechanical life	30.000 mechanical operations
Protection class	IP20
Cable section	1 mm ²

Electrical characteristics (according to IEC 60947)		
Rated current Un		Breaking capacity (10000 interruptions)
220 V AC	cosφ = 0.70	20 A
220 V AC	cosφ = 0.45	10 A
24 V DC	1 ms	12 A
	15 ms	9 A
	50 ms	6 A
60 V DC	1 ms	10 A
	15 ms	6 A
	50 ms	4.6 A
110 V DC	1 ms	7 A
	15 ms	4.5 A
	50 ms	3.5 A
220 V DC	1 ms	2 A
	15 ms	1.7 A
	50 ms	1.5 A
250 V DC	1 ms	2 A
	15 ms	1.4 A
	50 ms	1.2 A

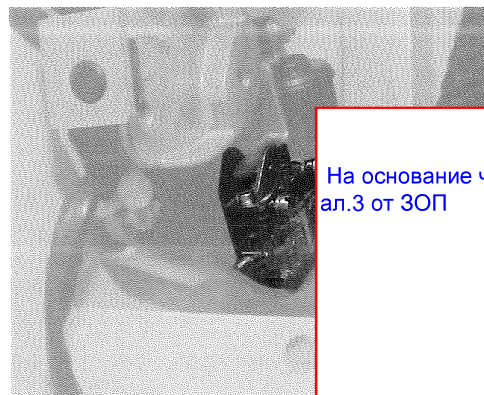
Electrical characteristics (according to IEC 62271-100 class 1)	
Rated voltage Un	Breaking capacity
24 V DC 20 ms	18.8 mA
60 V DC 20 ms	7.4 mA
110 V DC 20 ms	4.2 mA
250 V DC 20 ms	1.8 mA

8 Transient contact (-BGB4)

This contact closes momentarily (duration > 30 ms) upon circuit breaker opening controlled remotely with a shunt opening release.

The indication is not provided when opening is manual and local. In this case, a contact (-BGB11) is activated by the manual pushbutton and cuts off the transient contact closing signal (-BGB4).

The transient contact is activated directly from the main operating shaft, thus the indication is provided only on actual opening of the main circuit breaker contacts.



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Selection and ordering

Optional accessories

9 Position contact (-BGT3)

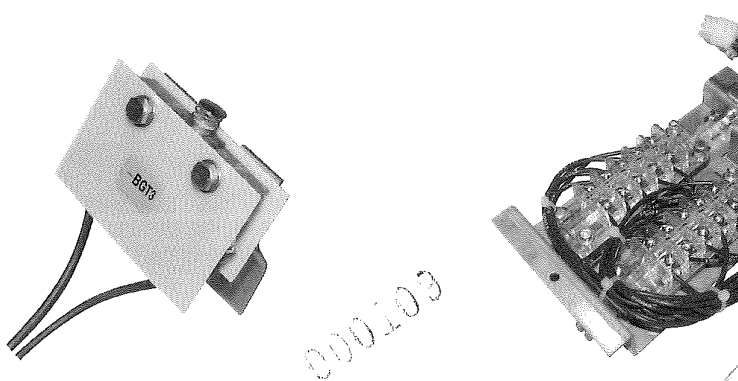
This contact is used, together with the locking magnet in the operating mechanism (-RLE1), to prevent remote closing as the circuit breaker is racked into the compartment.

It is only supplied for withdrawable circuit breakers for UniGear ZS1 switchgear and PowerCube modules.

It cannot be supplied when transmitted contacts in the truck are requested (-BGT1; -BGT2).

10 Transmitted contacts in the truck (-BGT1; -BGT2)

Transmitted contacts of withdrawable circuit breakers (installed in the circuit breaker truck - only for VD4/P withdrawable circuit breakers). These contacts are either in addition or alternatives to the position contacts (for signaling circuit breaker racked out). They also act as position contacts (-BGT3).



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11 Motor operator (-MAS)

Automatically loads the closing springs of the circuit breaker operating mechanism. After circuit breaker closing, the geared motor immediately reloads the closing springs.

If there is a power cut or during maintenance work, the closing spring can be loaded in the manual mode (by means of the special crank handle built into in the operating mechanism).

Characteristics	
Un	24...30 - 48...60 - 110...130 - 220...250 V~
Un	100...130 - 220...250 V~ 50/60 Hz
Operating limits	85 ... 110% Un
	≤ 40 kA 50 kA
Inrush power (Ps)	DC = 600 W; DC = 900 W; AC = 600 VA AC = 900 VA
Rated power (Pn)	DC = 200 W; DC = 350 W; AC = 200 VA AC = 350 VA
Inrush duration	0.2 s 0.2 s
Loading time	6-7 s 6-7 s
Insulation voltage	2000 V 50 Hz 2000 V 50 Hz (for 1 min) (for 1 min)

12 Contact for signaling closing spring loaded/ discharged (-BGS2)

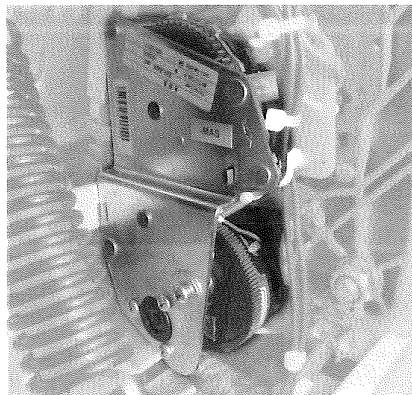
Consists of a microswitch which allows the state of the closing spring of the circuit breaker operating mechanism to be remotely signaled.

The following signals are possible:

- contact open: spring loaded signal
- contact closed: spring discharged signal.

The two signals must be used for circuits with the same power supply voltage.

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Selection and ordering

Optional accessories

Protections and locks

Various mechanical and electromechanical locking and protection devices are available.

13 Opening and closing pushbutton protection

The protection only allows the opening and closing pushbuttons to be operated using a special tool.

14 Opening and closing pushbutton padlock

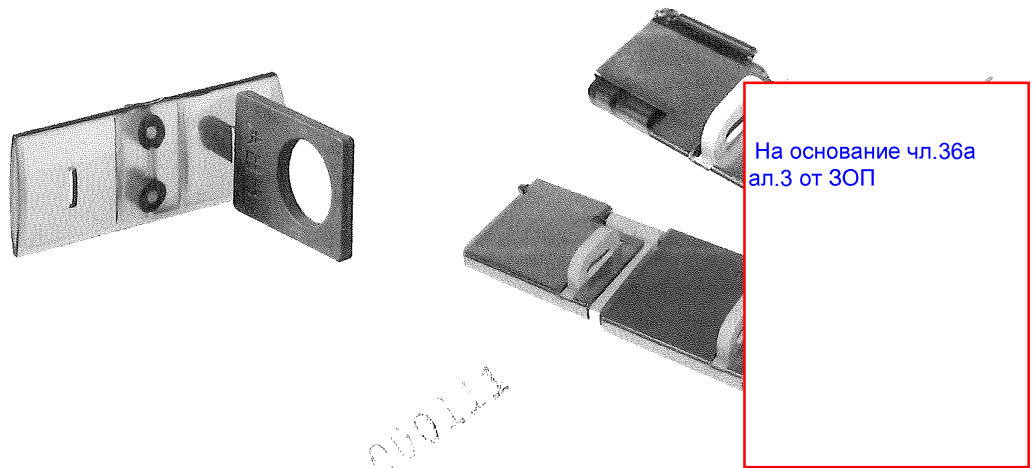
The device allows the opening and closing pushbuttons to be locked using up to three $\varnothing 4$ mm diameter padlocks (not supplied).

The padlock is available in two versions:

14A Possibility of padlocking both the pushbuttons without distinction

14B Separate padlocking of the opening and/or closing pushbutton.

N.B. Lock 14A prevents closing by remote control; lock 14B does not prevent closing by remote control.



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15 Key lock in open position

The lock is activated by a special circular lock. Different keys (for a single circuit breaker), or the same keys (for several circuit breakers) are available.

To activate the lock, keep the opening pushbutton pressed down, turn the key and remove it.

With the key removed, the opening pushbutton automatically remains in the pressed position, thereby preventing local manual closing and remote electrical closing.

16 Locking magnet on the operating mechanism (-RLE1)

Only allows the command to be activated when the electromagnet is energized.

The locking electromagnet in the operating mechanism has the same electrical characteristics as shunt closing release -MBC.

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Selection and ordering

Optional accessories

17 Locking magnet on the truck (-RLE2)

Mandatory accessory for withdrawable circuit breakers for UniGear ZS1 switchgear and PowerCube modules. Prevents the circuit breaker from racking into the switchgear when the auxiliary circuit plug is disconnected. The plug also acts as an anti-insertion lock if the rated current is different. Special striker pins prevent the plug from being inserted into the socket if the rated current of the circuit breaker is lower than the rated current of the panel.

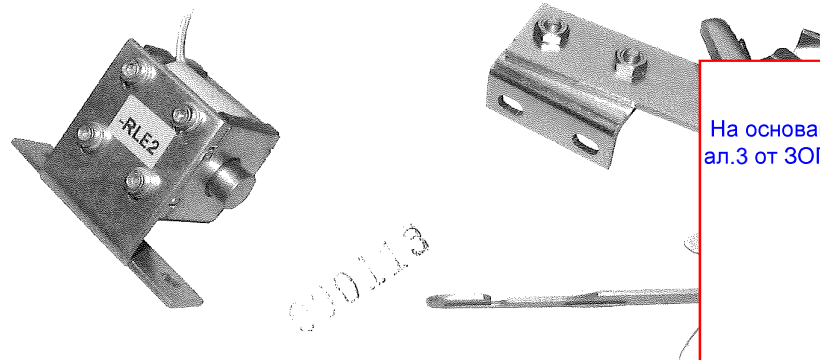
Note: a specific version for the circuit breakers of ZS8.4 switchgear is available on request. This accessory is not available when the motor-operated truck is required

Characteristics	
Un	24 - 30 - 48 - 60 - 110 - 125 - 127 - 132 - 220 - 240 V-
Un	24 - 30 - 48 - 60 - 110 - 125 - 127 - 220 - 230 ... 240 V~ 50/60 Hz
Operating limits	85 ... 110% Un
Inrush power (Pn)	DC 250 W; AC = 250 VA
Continuous power (Pc)	DC = 5 W; AC = 5 VA
Inrush duration	150 ms
Insulation voltage	2000 V 50 Hz (for 1 min)

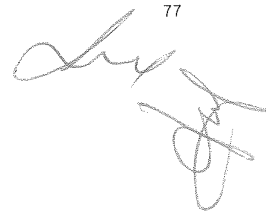
18 Interlock for fixed circuit breakers

Device for fixed circuit breakers which have been converted into withdrawable ones by the customer. It allows a mechanical lock to be created by the customer to prevent racking-out/in with the circuit breaker closed and prevents circuit breaker closing while moving.

Note: The device must be requested when ordering since it must be assembled and tested in the factory.



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**19 Mechanical interlock with door**

This device prevents the circuit breaker from being racked-in when the switchgear door is open. It is only provided for circuit breakers used in UniGear ZS1 switchgear and PowerCube modules equipped with a special actuator on the door.

It is not available for circuit breakers with motor-driven truck (-MAT).

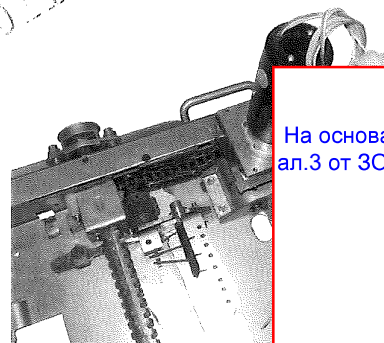
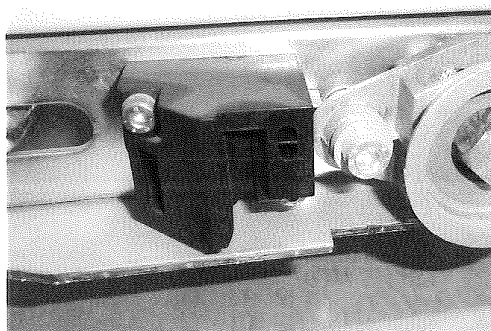
20 Motor-driven truck (-MAT)

Allows the circuit breaker to be remotely racked-in and out of the switchgear (only for withdrawable circuit breakers for UniGear ZS1 and ZS8.4 switchgear and PowerCube modules).

The motor-driven version with clutch can be ordered on request. It enables the circuit breaker to be racked-in/out in an emergency if the truck motor fails to operate.

Characteristics

Un	24 - 30 - 48 - 60 - 110 - 220 V-
Operating limits	85 ... 110% Un
Rated power (Pn)	40 W



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Selection and ordering

Optional accessories

21 STU Shunt Test Unit

Device which monitors the functionality and continuity of opening/closing shunt releases. Owing to their particular construction, checking the functionality of closing (-MBC) and opening (-MBO1, -MBO2) shunt releases cannot be performed by dedicated relays (e.g. TCS Test Control Supervision, CCC Control Coil Continuity) or with the REF control and protection unit. The only device able to monitor the functionality of these releases is the STU device. Please contact us if this function must be provided by devices other than STU.

The STU Shunt Test Unit can be used in conjunction with the shunt opening release (-MBO1; -MBO2) or shunt closing release (-MBC) to check their functionality and continuity.

The Shunt Test Unit allows the continuity of releases with rated operating voltage between 24 V and 250 V (AC and DC) to be monitored, as well as the functionality of the electronic circuit of the release.

Continuity is monitored cyclically with intervals of 20 seconds between one test and the next.

The unit has optical signals with LEDs on the front.

The following information is given:

- POWER ON: power supply present
- (-MO) TESTING: test in progress
- TEST FAILED: signal following a failed test or in the absence of auxiliary power supply
- ALARM: signal after three failed tests.

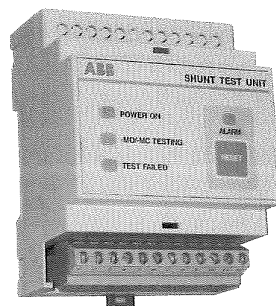
Two relays and a changeover are also available on the unit and allow the following two events to be remotely signaled:

- failure of a test (with automatic reset when alarm ceases)
- failure of three tests (resetting can only be obtained by means of the manual - RESET – from the front of the unit).

There is also a manual - RESET – key on the front of the unit.

Characteristics

Un	24 ... 250 V AC/DC
Maximum interrupted current	6 A
Maximum interrupted voltage	250 V AC



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For circuit breakers up to 40.5 kV, 40 kA with Classic operating mechanism

Accessories with the same number are alternatives to each other.

1 Shunt opening release -MO1 (-Y2)

The shunt opening release allows the apparatus to be opened by remote control.

An auxiliary contact -BB2 (-S4) always de-energizes it after opening.

Characteristics

Ua:	24 - 30 - 48 - 60 - 110 - 125 - 220 - 240 V-
Ua:	100 - 110 - 125 - 220 - 230 - 240 V ~ 50 ... 60 Hz
Service tolerances:	DC 70 ... 110% Ua
	AC 85 ... 110% Ua
Short-term power consumption:	approx. DC 250 W; approx. AC 250 VA
Admissible maximum operating time:	8 s

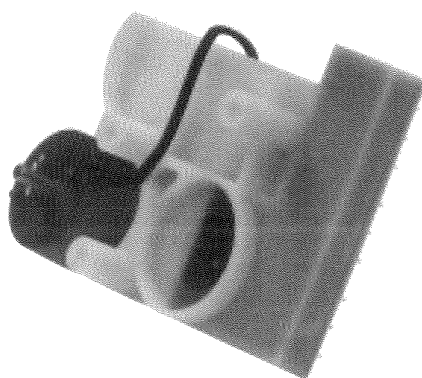
2 Additional shunt opening release -MO2 (-Y9)

The additional shunt opening release has the same function as shunt opening release -MO1 (-Y02).

The additional shunt opening release is available on request and requires use of auxiliary contact -BB1 (-S3), which is part of the standard equipment.

Characteristics

Ua:	24 - 30 - 48 - 60 - 110 - 125 - 220 - 240 V-
Ua:	100 - 110 - 125 - 220 - 230 - 240 V ~ 50 ... 60 Hz
Service tolerances:	DC 70 ... 110% Ua
	AC 85 ... 110% Ua
Short-term power consumption:	approx. DC 250 W; approx. AC 250 VA
Admissible maximum operating time:	8 s



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Selection and ordering

Optional accessories

3 Shunt closing release -MC (-Y3)

The shunt closing release allows the circuit breaker to be closed by remote control.

Auxiliary contact -BS1 (-S1) cuts off the power supplied to the release after the closing springs have been loaded, while auxiliary contact -BB1 (-S3) cuts off the power supplied to the release after the circuit breaker has closed.

Both are required and are part of the standard equipment.

The shunt closing release is optional in circuit breakers with manual opening mechanisms but mandatory for circuit breakers with motor-operated drives.

Application of the shunt closing release includes anti-pumping relay -K0.

The permanently supplied release provides the electrical anti-pumping function with both electrical opening and re-closing commands maintained.

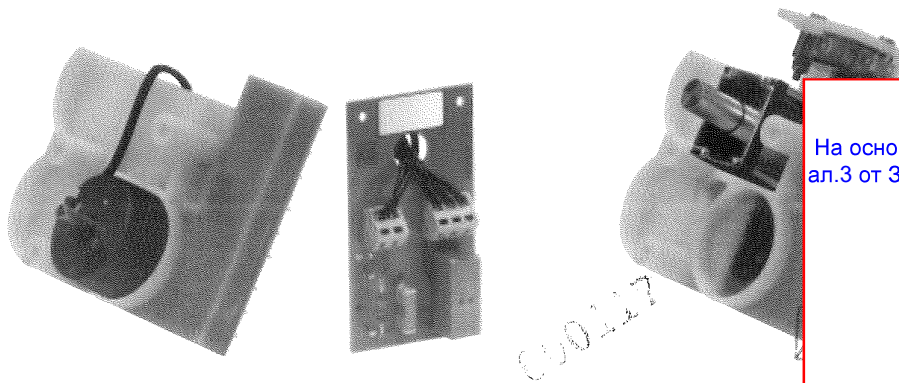
Circuit breaker closing is only re-enabled once the active closing command has been interrupted.

Characteristics	
Ua:	24 - 30 - 48 - 60 - 110 - 125 - 220 - 240 V-
Ua:	100 - 110 - 125 - 220 - 230 - 240 V ~ 50 ... 60 Hz
Service tolerances:	DC 70 ... 110% Ua AC 70 ... 110% Ua
Short-term power consumption:	approx. DC 250 W; approx. AC 250 VA
Admissible maximum operating time:	8 s

4 Locking magnet on operating mechanism RL1 (-Y1) with auxiliary contacts -BL1 (-S2)

Only allows the operating mechanism to be activated when the electromagnet is energized. To enable the circuit breaker to close, the locking magnet must be energized for at least 100 ms before the circuit breaker closing command. Auxiliary contact -BL1 (-S2) is required and is part of the standard equipment.

Characteristics	
Ua:	24 - 30 - 48 - 60 - 110 - 125 - 220 - 240 V-
Ua:	100 - 110 - 125 - 220 - 230 - 240 V ~ 50 ... 60 Hz
Service tolerances:	DC 85 ... 110% Ua AC 85 ... 110% Ua
Short-term power consumption:	approx. DC 10 W; approx. AC 10 VA
Admissible maximum operating time:	unlimited



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5 Undervoltage release -MU (-Y4)

The undervoltage release opens the circuit breaker when there is an appreciable drop or lack of the voltage that supplies it.

It trips when the auxiliary voltage is between 70% and 30% of its rated value.

The circuit breaker can only close again when the voltage reaches 85% of its rated value.

The undervoltage release trips instantaneously, but can also be accompanied by an electronic time-lag device.

Characteristics of the non-delayed version

Ua: 24 - 30 - 48 - 60 - 110 - 125 - 220 V-

Ua: 100 - 110 - 125 - 220 V ~ 50 ... 60 Hz

Power consumption: approx. DC 10 W
approx. AC 11 VA

Maximum service tolerance: 110% Ua

Voltage for readiness closing: > 85% UN

Trip voltage: 30 ... 70% Ua

Operating time: immediate

Admissible maximum operating time: none

5.1 Electronic time-lag device -KT (-RN3U)

Use of the delayed undervoltage release is useful for preventing trips when the supply network of the release may be subject to power cuts or brief voltage dips.

The voltage of the undervoltage release must be within the operating range of the electronic time-lag device (a coupler transformer must be connected in series for rated voltages other than 100-110 V AC).

The electronic time-lag device must be assembled externally in relation to the circuit breaker. It allows the tripping action of the release to be delayed on the basis of preset and adjustable time settings.

Characteristics

Ua: 100 - 110 V ~ 50 ... 60 Hz

Power consumption: approx. AC 10 VA

Service tolerances: 110% Ua

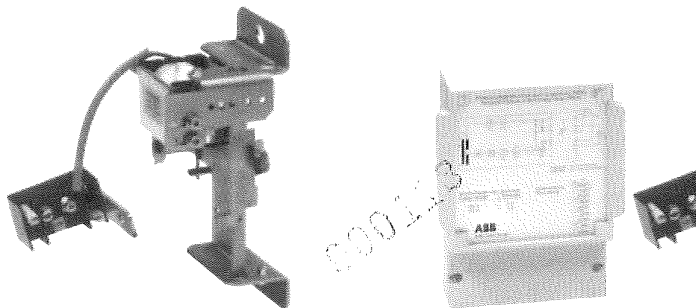
Voltage for readiness closing: > 70% Ua

Trip voltage: < 70% Ua

a) standard: operating time 0.5... 4 s, adjustable in 0.5 s steps

b) when closing is performed by means of auxiliary contacts: operating time is 0.5... 2s, adjustable in 0.5s steps with suitable coil

Admissible maximum operating time: none



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Selection and ordering

Optional accessories

6 Opening solenoid -MO3 (-Y7)

Use of the overcurrent release may be advisable in systems where the auxiliary voltage is unable to provide reliable continuity of service.

The release must receive the opening pulse on the basis of the current from the secondary winding of an intermediate current transformer or a delayed overvoltage relay.

During continuous service, the secondary winding of the MO3 is short-circuited by an auxiliary contact.

Characteristics

Power consumption in continuous service mode:	connection to 2 phases 35 VA connection to 3 phases 2 VA
Tripping power consumption:	approx. 15 VA
Readiness tripping:	70% IN
Power consumption of intermediate current transformer at IN = 5 A and continuous operation (short-circuited secondary winding):	Winding A 1 VA Winding B 1 VA Winding C 1.5 VA
Power consumption of intermediate current transformer at IN = 5 A and continuous operation (open secondary winding):	Winding A 15 VA Winding B 15 VA Winding C 25 VA
Primary current of intermediate current transformer:	3 x 5
Secondary current of intermediate current transformer:	~ 0.4 A

7 Auxiliary contacts of circuit breaker -BS1, -BB1, -BB2, -BB3 (S1, S3, S4, S5)

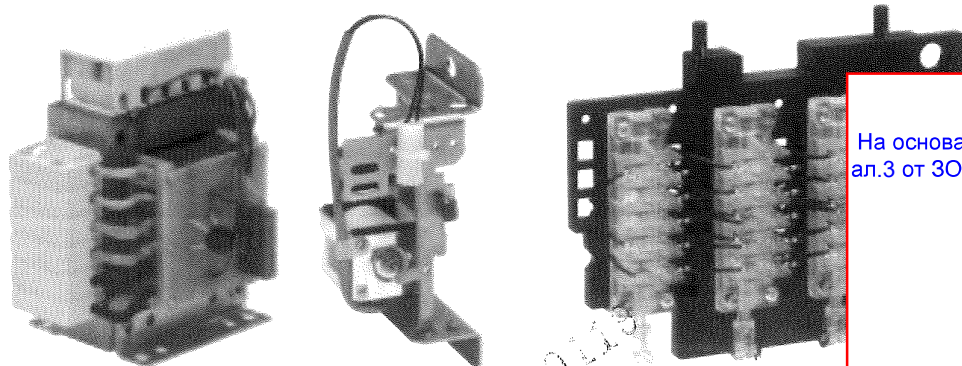
The circuit breaker can be equipped with five-pole auxiliary contacts for monitoring, interlocking and signaling. Auxiliary contact -BB2 (-S4) is part of the basic equipment of all circuit breakers with motor-driven operating mechanisms.

Auxiliary contact -BB3 (-S5) is optional.

Also consult the circuit-diagram.

Characteristics

Ua:	24 ... 250 V
Test voltage:	2.5 kV
Rated current:	I _{th} ² = 10 A



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8 Auxiliary contact for signaling effective opening -BB4 (-S7)

Auxiliary contact -BB4 (-S7), also known as transient contact, is part of the basic equipment of all circuit breakers.

It is used for signaling effective opening of the circuit breaker (the transient signal lasts 30ms).

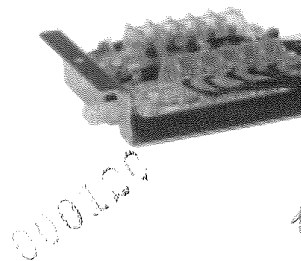
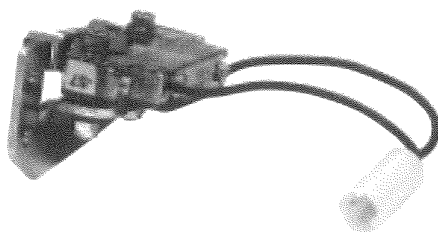
Characteristics	
Ua:	24 ... 250 V
Test voltage:	2.5 kV
Rated current:	$I_{th}^2 = 10 \text{ A}$

9 Transmitted contacts in truck -BT1, -BT2 (-S8, -S9)

The auxiliary contacts signal whether the circuit breaker is racked in or out.

In the intermediate position, the circuit breaker is mechanically interlocked.

Characteristics	
Ua:	24 ... 250 V
Test voltage:	2.5 kV
Rated current:	$I_{th}^2 = 10 \text{ A}$



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Selection and ordering

Optional accessories

10 Motor-operated drive -MS (-M0)

The spiral spring of circuit breakers with motor-operated drive is automatically loaded by an electric motor installed in the actual drive on the load side of each closing operation.

Characteristics	
Ua:	24 - 30 - 48 - 60 - 110 - 125 - 220 - 240 V-
Ua:	110 - 240 V ~ 50 ... 60 Hz
Loading time:	max. 15 s
Reloading time:	max. 15 s
Service tolerances:	85 ... 110% Ua
Power consumption during loading:	approx. DC 230 ... 260 W; approx. AC 260 VA
Weight:	1.5 kg

Fuse motor:			
rated supply voltage	power consumption	Fuse motor (ABB-Stotz mcb)	loading time (maximum)
V	VA/W	A	S
AC 110	260	1.6 S 281 UC-K	10
220	260	0.75	10
240	260	0.75	10
DC 110	230	1.60	10
125	260	1.60	10
220	240	0.75	10
240	260	0.75	10
24			15
30			15
48			15
60			15

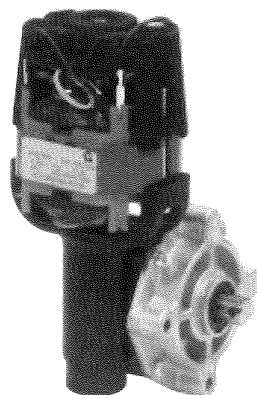
Properties of Gefeg motor

Ua:	24 - 48 - 60 - 110 - 125 - 220 - 240 V-
Ua:	110 - 240 V ~ 50 ... 60 Hz
Loading time:	max. 15 s
Reloading time:	max. 15 s
Service tolerances:	85 ... 110% Ua
Power consumption during loading:	app. DC 130 ... 140 W; app. AC 150 - 170 VA
Weight:	1.5 kg

Fuse motor:

rated supply voltage	power consumption	Fuse motor (ABB-Stotz mcb)	loading time (maximum)
V	VA/W	A	S
AC 110	150	1.6 S 281 UC-K	15
220	150	0.75	15
240	170	0.75	15
DC 24	130	4.0 S 282 UC-K	15
48	130	3.00	15
60	130	2.00	15
110	140	1.00 / 1.60 *	10
125	160	1.00 / 1.60 *	15
220	140	0.75	15
240	150	0.75	15

* VD4 63 kA motor

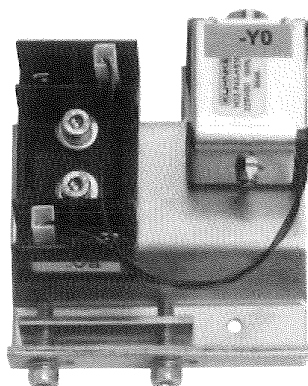


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11 Locking magnet on truck -RL2 (-Y0)

The locking magnet on the truck prevents circuit breaker travel in the absence of auxiliary voltage.

Characteristics	
Ua:	24 - 30 - 48 - 60 - 110 - 125 - 220 - 240 V-
Ua:	100 - 110 - 125 - 220 - 230 - 240 V ~ 50 ... 60 Hz
Service tolerances:	DC; AC 85 ... 110% Ua
Power consumption:	approx. DC 10 W; approx. AC 10 VA
Admissible maximum operating time:	unlimited

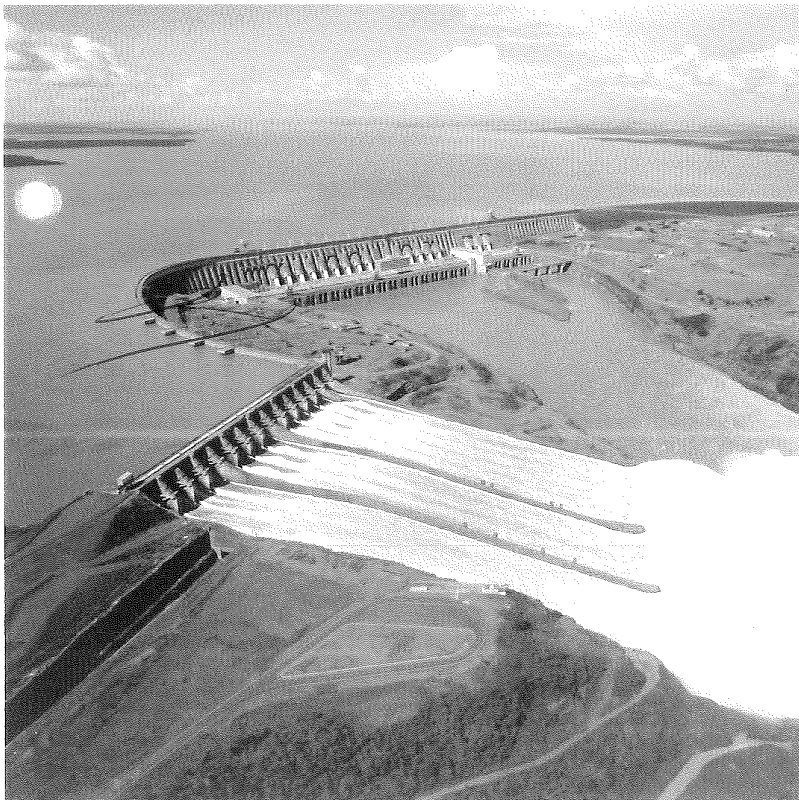
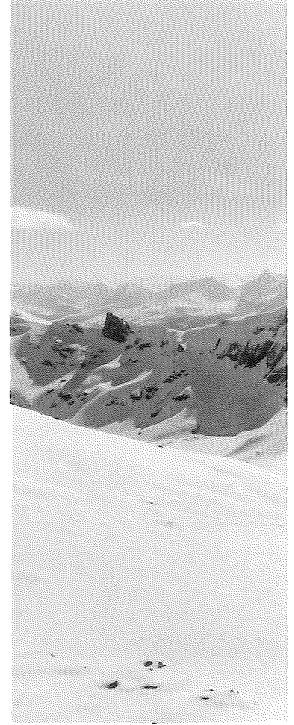


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На основании чл.36а
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Specific product characteristics



Vibration resistance

VD4 circuit breakers are designed to provide high levels of resistance to stress caused by mechanical vibrations.

Many versions comply with the type-approval criteria of the major International Shipping Registers (DNV, Lloyd's Register, RINA) and the qualification criteria of the International Seismic Standards (IEEE 344, IEEE 323 and IEC 60980). Please contact us if you wish to know which versions have been type-approved by the shipping registers.

Tropicalization

VD4 circuit breakers are manufactured in compliance with the most stringent specifications concerning their use in hot-

All the more important metals are protected against corrosive substances and atmospheric corrosion class **EN 12500**.
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Galvanizing treatment is applied in accordance with ISO 2081 Standards, class 12, thickness 12×10^{-6} m, protective layer formed mainly by chromium with ISO 4520 Standards.



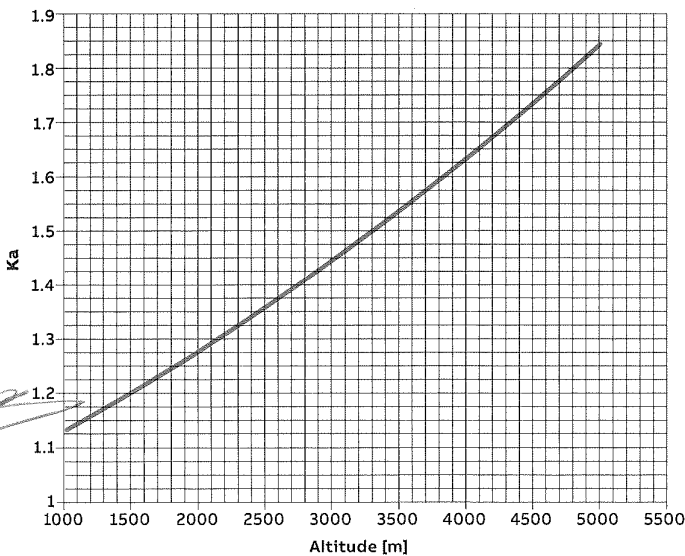
Altitude

The insulating property of air decreases as the altitude increases, therefore this must always be considered with regard to the external insulation of the apparatus (the internal insulation of the interrupters is not liable to change since it is guaranteed by the vacuum).

Altitude must always be taken into account when the insulating components of apparatus to be installed over 1000 m above sea level is designed. In these cases a correction coefficient must be applied. This can be found from the graph on the next page, which has been created on the basis of the indications in Standard IEC 62271-1.

The following example provides a clear interpretation of the indications given above.

Graph for determining the Ka correction factor according to altitude, Example (IEC):



$Ka = e^{-H/1000}$ with $m=1$
 H = altitude in meters
 m = value with reference to power frequency test voltage and lightning impulse withstand voltage as well as line-to-line voltage. Value defined for $m = 1$

- Installation altitude: 2000 m
- Service at 7 kV rated voltage
- Power frequency withstand voltage 20 kV rms
- Impulse withstand voltage 60 kVp
- Ka Factor = 1.28 (see graph).

On the basis of the parameters above, the apparatus must ensure the following withstand values (test performed at zero altitude i.e. at sea level):

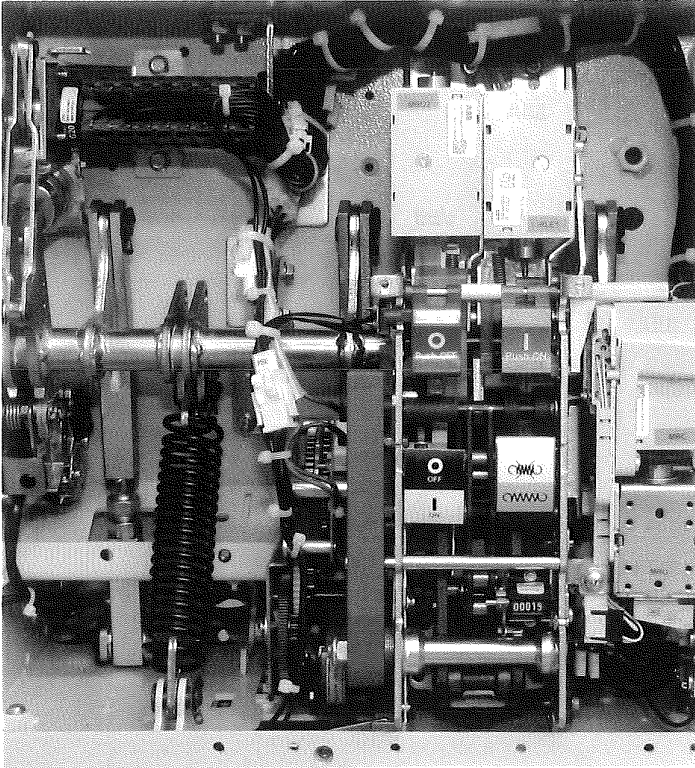
- power frequency withstand voltage equal to:
 $20 \times 1.28 = 25.6 \text{ kVrms}$
- impulse withstand voltage equal to:
 $60 \times 1.28 = 76.8 \text{ kVp}$.

It will be apparent from the al with 17 kV rated voltage char rms power frequency insulati impulse withstand voltage m installations at an altitude of level with 12 kV service voltag

На основании чл.36а ал.3 от ЗОП

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Specific product characteristics



Anti-pumping device

The EL operating mechanism of VD4 circuit breakers (in all versions) is equipped with a mechanical anti-pumping device which prevents re-closing due to both electrical and mechanical commands.

Should both the closing command and any one of the opening commands (local or remote) be active at the same time, there would be a continuous succession of opening and closing commands.

The anti-pumping device prevents this situation by ensuring that each closing operation is only followed by an opening operation and that there is no other closing operation after this. To obtain a further closing operation, the closing command must be released and then enabled again.

Furthermore, the anti-pumping device only allows the circuit breaker to be closed if the following conditions are present at the same time:

- operating mechanism spring fully loaded
- opening pushbutton and/or shunt opening release (-MBO1/-MBO2) not activated
- circuit breaker open.

REF 601 protection device

On request, the REF 601 switchgear protection device is available for protecting the installations. It requires an auxiliary power supply in order to operate, unlike the previous PR512 which was a self-supplied relay.

REF 601 has protections and trip curves that conform to IEC 255-3 Standards. It protects against overloads (51), against instantaneous and delayed short-circuits (50-51) and against instantaneous and delayed homopolar earth faults (50N and 51N). It also detects the second harmonic component to prevent unwarranted tripping when a transformer is switched-in (68).

The unit has 3 inputs from current sensors of the Rogowsky coil type and one input from an external ring-type CT. 4 rated currents can be set via the keyboard: 40, 80, 250 and 1250 A.

If the unit is connected to 3 current sensors, the 50N and 51N protection functions are obtained by means of the vectorial sum of the phase currents. If only 2 current sensors are used, an external ring-type current transformer must be provided for functions 50N and 51N.

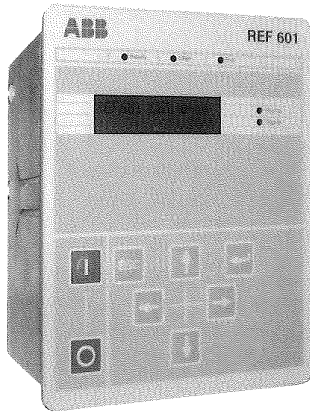
The external ring-type current transformer can have an openable or closed core and any transformation ratio so long as the secondary current is 1 A.

The ABB current sensors of the Rogowsky coil type provided for REF 601 are only suitable for installation on MV insulated cables.

The characteristics of the device are:

- trip precision
- broad adjustment ranges
- single and simultaneous adjustment of the three phases
- no limitation (due to the current sensors) to the rated breaking capacity or short-time withstand current of the circuit breaker
- pushbuttons for local electrical operation of the circuit breaker (opening and closing pushbutton)
- 5 distinct indicators: "relay operating", "relay in trip threshold", "relay trip", "relay in trip exceeded", "phase current having exceeded"
- interface consisting of an "arrow", "enter" and "esc" navigation in the "measure recording", "event recording", "configuration" and "test"

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- three user levels: “operator” (display only, with free access by keeping this key pressed for at least 5 sec.), “configurator” (same as the previous level) but also with authorization to set the protection parameters (i.e. times and thresholds), and communication if present (access limited by a password), “administrator” (same as the previous levels), but also with authorization to set the password and configure the basic settings of the device, such as the rated current (access limited by a password)
- continuous display of the current on the most highly loaded phase and of the earth current
- recording of the value of the currents which caused the device to trip
- storage of the number of openings carried out by the device
- event log (storage of the parameters described above in the last 5 trips of the device) in a non-volatile memory
- curves “ $\beta = 1$ ” or “ $\beta = 5$ ” and curve “RI” specifically designed for the Belgian market (only REF 601 IEC)
- circuit breaker opening by means of an undervoltage release (only REF 601 CEI)
- version, on request, with RS485 4-wire serial communication
- MODBUS RTU full duplex protocol
- multi-voltage feeder 24 ... 240 V AC- DC
- REF 601 is also available in a version specifically designed for the Italian market to CEI 0-16 standards (see brochure entitled “Solutions for upgrading to CEI 0-16 standards”), with 80 or 250 A rated current which can be selected via the keyboard. It is always supplied with 3 sensors for installation on insulated MV cable, a 40/1 A ring-type CT for homopolar protection and undervoltage release for the circuit breaker opening operation.

Environmental protection programme

VD4 circuit breakers are manufactured in accordance with the ISO 14000 Standards (Guidelines for environmental management). The production processes are implemented in accordance with the environmental protection standards as to the reduction of energy consumption and the production of waste. All this is achieved thanks to the environmental management system applied in the medium voltage apparatus manufacturing facility. Assessment of the environmental impact during the life-cycle of the product obtained by reducing the overall energy consumption and use of raw materials to the minimum, is put into effect during the design engineering stage through an accurate choice of materials, processes and packaging. This to allow the products and components to be recycled to the utmost degree at the end of their useful life.

Spare parts

- Shunt opening release
- Additional shunt opening release
- Undervoltage release
- Time-lag device for undervoltage release
- Shunt closing release
- Spring loading geared motor with electrical signaling of spring loaded
- Contact signaling geared motor protection circuit breaker open/closed
- Contact signaling closing spring loaded/ discharged
- Transient contact with momentary closing during circuit breaker opening
- Circuit breaker auxiliary contacts
- Locking electromagnet on the operating mechanism
- Position contact of the withdrawable truck
- Contacts signaling connected/isolated
- Opening solenoid
- Open position key lock
- Isolation interlock with door
- Protection for opening pushbutton
- Protection for closing pushbutton
- Locking electromagnet on withdrawal mechanism
- Set of six isolating contacts.

Ordering

For availability and to order spare parts contact our Service department with the circuit breaker serial number.

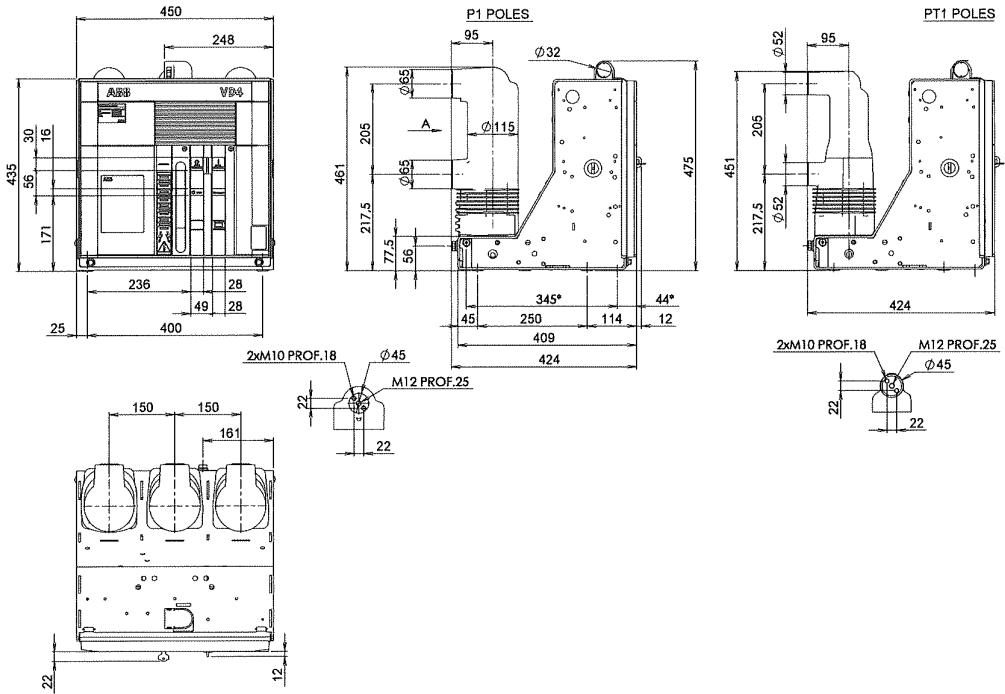
На основании чл.36а
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Overall dimensions

Fixed circuit breakers

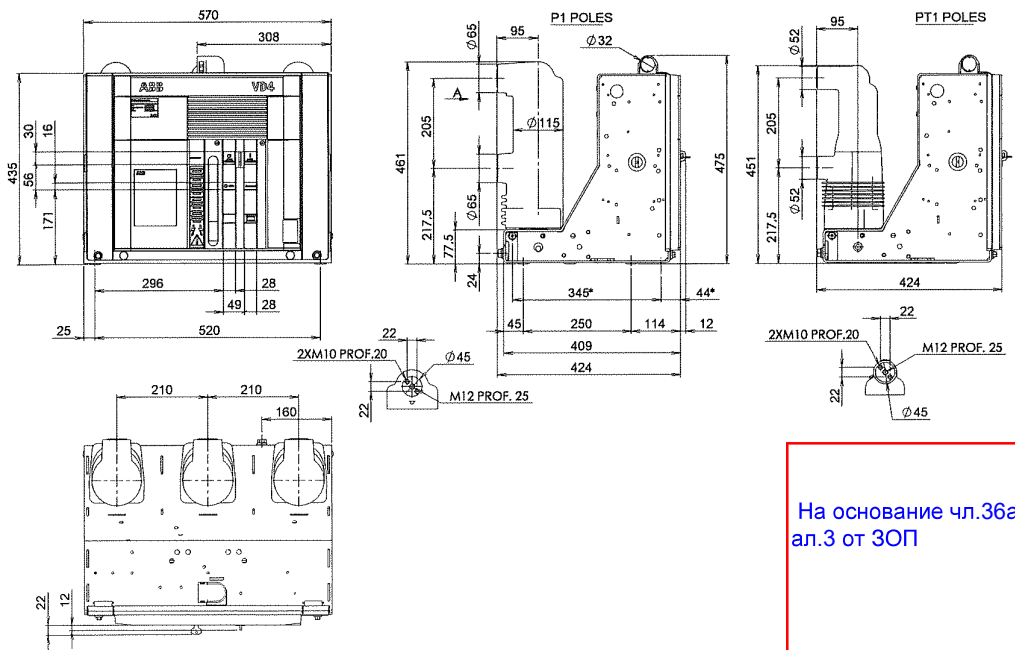
VD4	
TN	7405
Ur	12 kV 17.5 kV
Ir	630 A 1250 A
Isc	16 kA
	20 kA
	25 kA 31.5 kA



(*) Fixing interchangeability with previous series (345 x 400).

Fixed circuit breakers

VD4	
TN	7406
Ur	12 kV 17.5 kV
Ir	630 A 1250 A
Isc	16 kA
	20 kA
	25 kA 31.5 kA



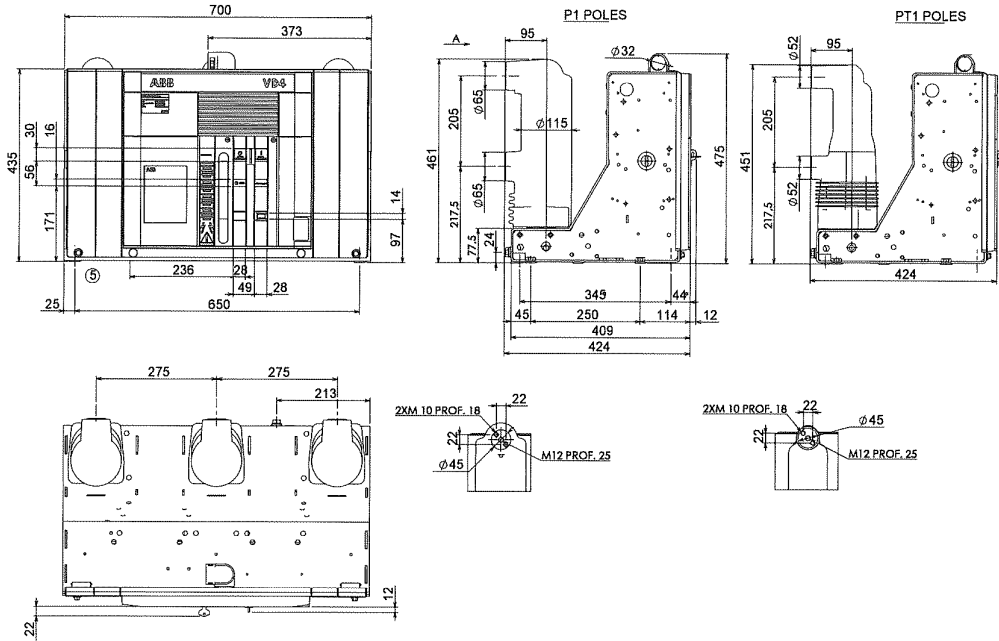
(*) Fixing interchangeability with previous series (345 x 520).

На основании чл.36а
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Fixed circuit breakers

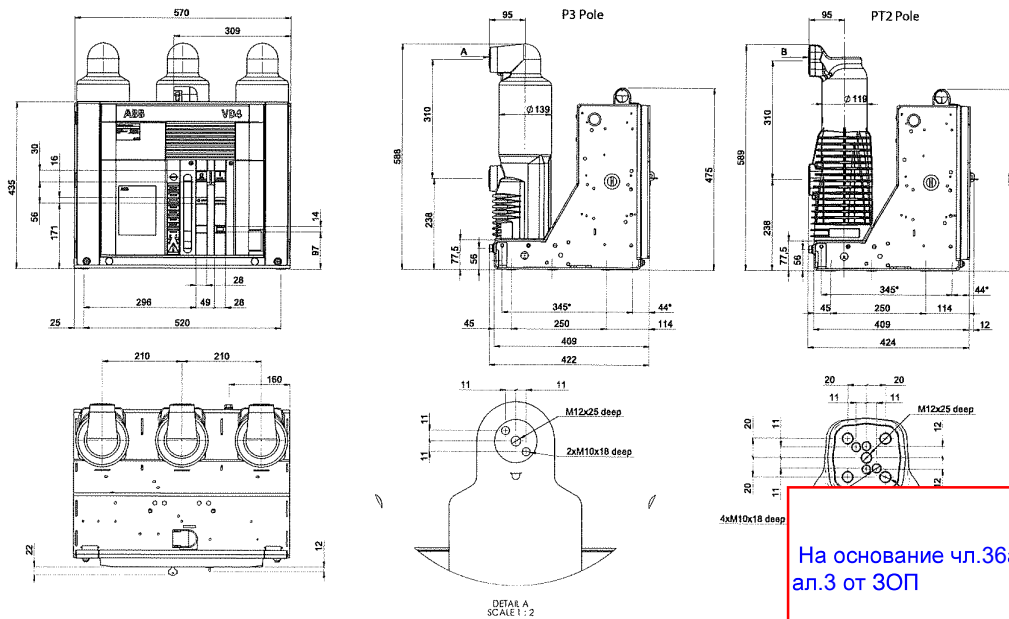
VD4	
TN	1VCD000051
Ur	12 kV 17.5 kV
Ir	630 A 1250 A
Isc	16 kA 20 kA 25 kA 31.5 kA



(*) Fixing interchangeability with previous series (345 x 650).

Fixed circuit breakers

VD4	
TN	1VCD003282
Ur	12 kV 17.5 kV
Ir	1250 A 1600 A
Isc	40 kA



Type	Pole	Ur	Ir	Isc	Oper Mech
VD4 p210	P3	12-17.5 kV	1250A-1600A	40kA	EL
VD4 p210	PT2	12-17.5 kV	1250A-1600A	40kA	EL

(*) Fixing interchangeability with previous series (345 x 650).

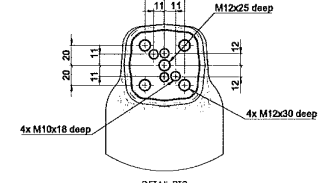
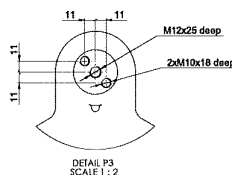
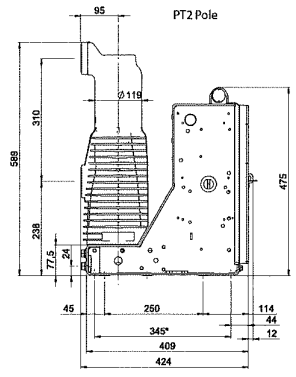
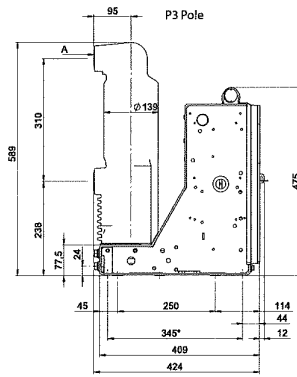
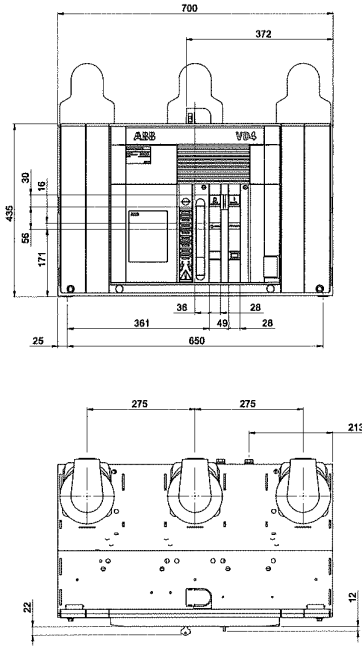
На основании чл.36а
ал.3 от ЗОП

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Overall dimensions

Fixed circuit breakers

VD4	
TN	1VCD0032B5
Ur	12 kV
	17.5 kV
I _r	1250 A
	1600 A
I _{sc}	40 kA

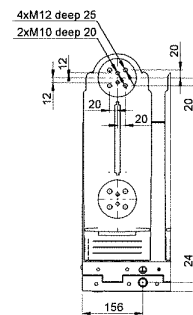
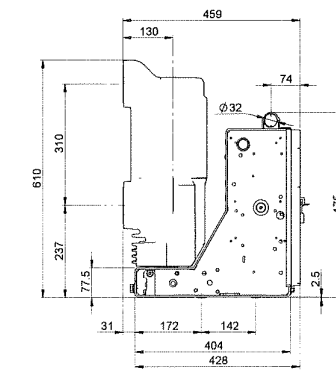
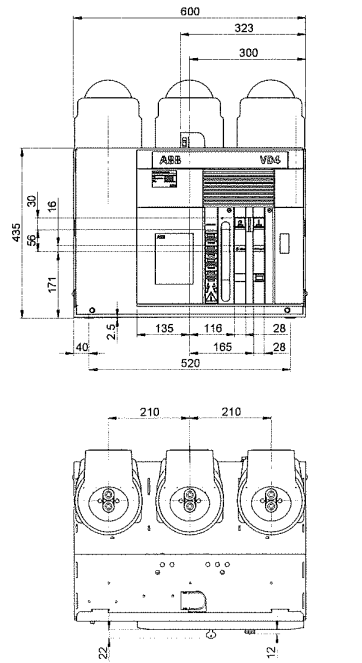


Type	Pole	Ur	I _r	I _{sc}	Operating Mechanism	Version for
VD4 p275	P3	12-17.5 kV	1250A-1600A	40kA	EL	free standing installation
VD4 p275	PT2	12-17.5 kV	1250A-1600A	40kA	EL	free standing installation

(*) Fixing interchangeability with previous series (345 x 650).

Fixed circuit breakers

VD4	
TN	1VCD003440
Ur	12 kV
	17.5 kV
I _r	1250 A
	1600 A
	2000 A
I _{sc}	50 kA

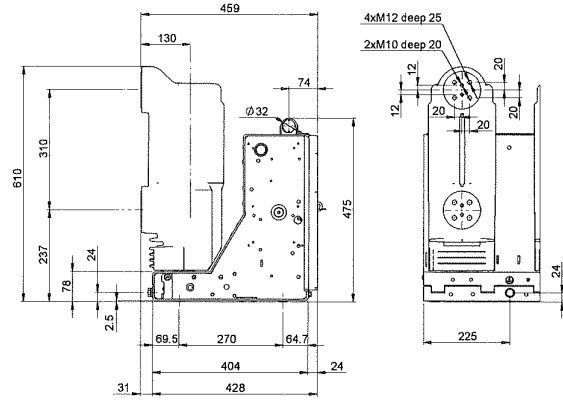
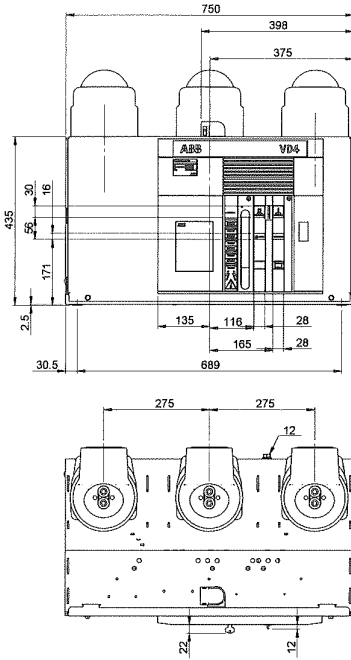


На основании чл.36а
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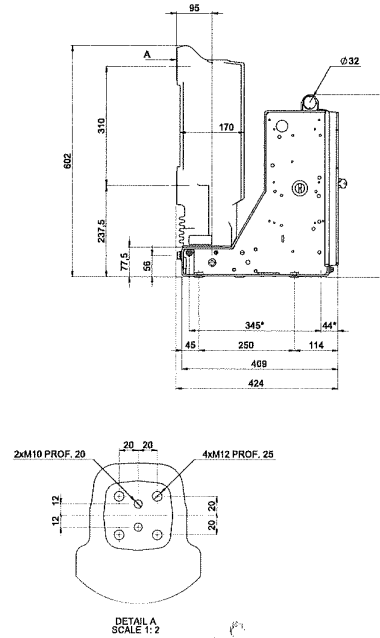
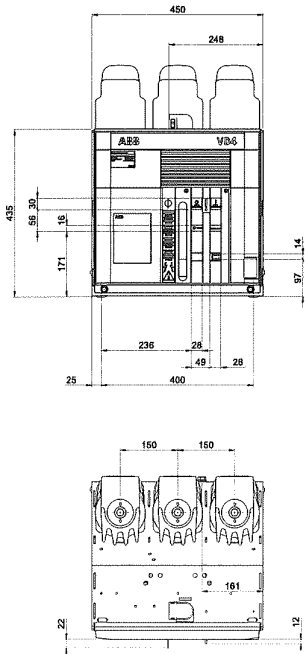
Fixed circuit breakers

VD4	
TN	1VCD003441
Ur	12 kV 17.5 kV
I _r	1250 A
	1600 A
	2000 A
	2500 A
I _{sc}	50 kA



Fixed circuit breakers

VD4	
TN	1VCD000050
Ur	12 kV
I _r	1600 A
	20 kA
I _{sc}	25 kA
	31.5 kA



На основании чл.36а
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(*) Fixing interchangeability with previous series (345 x 400).

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Overall dimensions

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Fixed circuit breakers

VD4

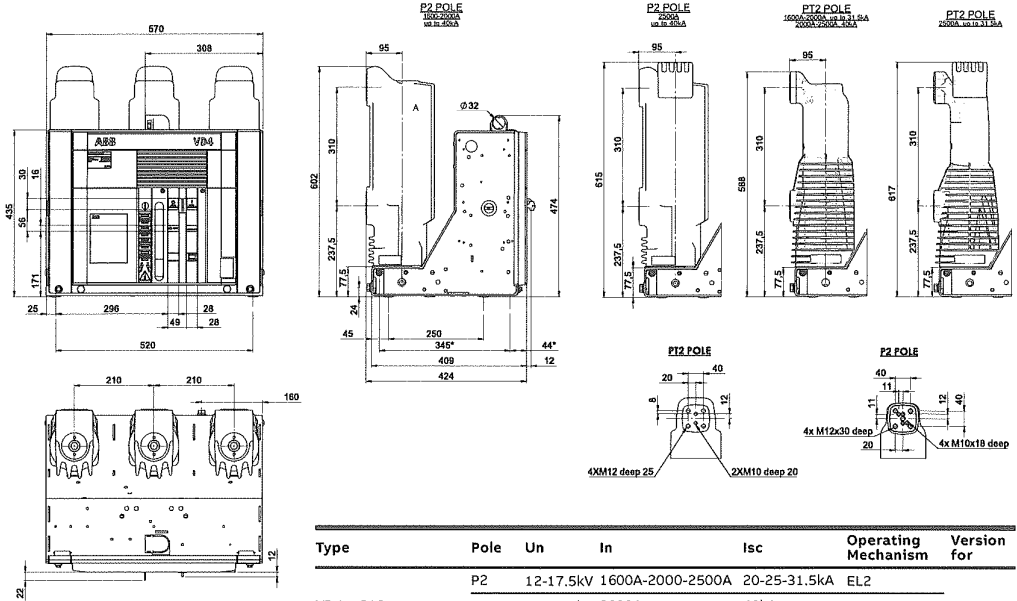
TN	7407
Ur	12-17.5 kV
Ir	1600 A
	20 kA
Isc	25 kA
	31.5 kA

VD4

TN	7407
Ur	12-17.5 kV
Ir	2000 A
	20 kA
Isc	25 kA
	31.5 kA
	40 kA

VD4

TN	7407
Ur	12 kV
Ir	2500 A
	20 kA
Isc	25 kA
	31.5 kA
	40 kA



Type	Pole	Un	In	Isc	Operating Mechanism	Version for
VD4 p.210	P2	12-17.5kV	1600A-2000-2500A	20-25-31.5kA	EL2	free standing version
		12-17.5kV	2000A	40kA	EL3	
VD4 12/**/**/G p.210	12kV	1600A-2000-2500A	20-25-31.5kA	EL2		
VD4 p.210	P2	12-17.5kV	1600A-2000-2500A	20-25-31.5kA	EL3	free standing version
		12-17.5kV	2000A	40kA	EL3S	
VD4 12/**/**/G p.210	12kV	1600A-2000-2500A	20-25-31.5kA	EL3		
		2500A	40kA	EL3S		

(*) Fixing interchangeability with previous series (345 x 650).

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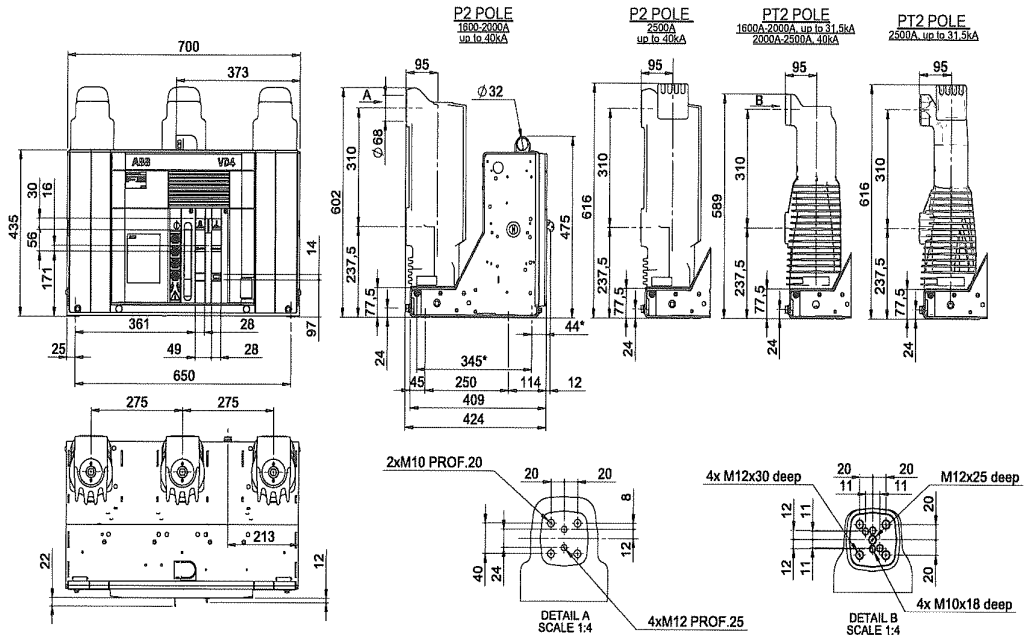
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Fixed circuit breakers

VD4	
TN	7408
Ur	12 kV
	17.5 kV
Ir	1600 A
	20 kA
Isc	25 kA
	31.5 kA

VD4	
TN	7408
Ur	12 kV
	17.5 kV
Ir	2000 A
	2500 A
	20 kA
Isc	25 kA
	31.5 kA
	40 kA



Type	Poles	Un	In	Isc	Operating Mechanism	Version for
VD4 p.275	P2	12-17.5kV	1600A-2000-2500A	20-25-31.5kA	EL2	free standing version
		12-17.5kV	2000-2500A	40kA	EL3	
VD4 12/**/**/G p.275	P2	12kV	1600A-2000-2500A	20-25-31.5kA	EL2	
		12kV	2000-2500A	40kA	EL3	
VD4 p.275	PT2	12-17.5kV	1600A-2000-2500A	20-25-31.5kA	EL3	
		12-17.5kV	2000-2500A	40kA	EL3S	
VD4 12/**/**/G p.275	PT2	12kV	1600A-2000-2500A	20-25-31.5kA	EL3	
		12kV	2000-2500A	40kA	EL3S	

(*) Fixing interchangeability with previous series (345 x 650).

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