
DISTRIBUTION SOLUTIONS

HD4

Gas insulated MV circuit breakers
up to: 40.5 kV; 4000 A; 50 kA



Selection and ordering

General characteristics
of fixed circuit breakers (12 kV)



Circuit breaker		HD4 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 normal current (40 °C) ⁽¹⁾	Ir [A]	630	1250	630	1250	1600	1600	2000	2500	3150	3600
		16	16	16	16	–	16	–	–	–	–
		25	25	25	25	–	25	25	25	25	25
Rated breaking capacity	Isc [kA]	31.5	31.5	31.5	31.5	–	31.5	31.5	31.5	31.5	31.5
		–	–	–	–	40	–	40	40	40	40
		–	–	–	–	50	–	50	50	50	50
		16	16	16	16	–	16	–	–	–	–
		25	25	25	25	–	25	25	25	25	25
Rated short-time withstand current (3 s)	Ik [kA]	31.5	31.5	31.5	31.5	–	31.5	31.5	31.5	31.5	31.5
		–	–	–	–	40	–	40	40	40	40
		–	–	–	–	50	–	50	50	50	50
		40	40	40	40	–	40	–	–	–	–
		63	63	63	63	–	63	63	63	63	63
Making capacity	Ip [kA]	80	80	80	80	–	80	80	80	80	80
		–	–	–	–	100	–	100	100	100	100
		–	–	–	–	125	–	125	125	125	125
		–	–	–	–	–	–	–	–	–	–
Operation sequence	[O-0.3s-CO-15s-CO] •										
Opening time	[ms]	35-60									
Arcing time	[ms]	10-15									
Total breaking time	[ms]	45-75									
Closing time	[ms]	≤85									
Overall dimensions		H [mm]	586	623	655	649	655				
		W [mm]	496	618	618	618	730				
		D [mm]	446	446	561	561	603				
		Pole centre distance I [mm]	150	210	210	210	275				
Weight	[Kg]	114	114	145	114	165					
Standardised table of dimensions		1VCD000226	1VCD000231	TN 7163	TN 7178	TN 7165					
Absolute SF ₆ gas pressure ⁽²⁾	[kPa]	380 (430 a 31.5 kA)				380					
Operating temperature	[°C]	- 5 ... + 40 °C									
Tropicalization	IEC: 60068-2-30, 60721-2-1 •										
Electromagnetic compatibility	IEC 62271-1 •										

(1) Rated normal current defined in free air.

(2) Rated service value.

(3) Including insulating shields (available on request).

General characteristics of fixed circuit breakers (17.5 kV)



Circuit breaker		HD4 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 normal current (40 °C) ⁽¹⁾	Ir [A]	630	1250	1600	1600	2000	2500	2000	2500	
		16	16	–	16	–	–	–	–	
		25	25	–	25	25	25	25	25	
Rated breaking capacity	Isc [kA]	31.5	31.5	–	31.5	31.5	31.5	31.5	31.5	
		–	–	40	–	40	40	40	40	
		–	–	50	–	50	50	50	50	
Rated short-time withstand current (3 s)	Ik [kA]	16	16	–	16	–	–	–	–	
		25	25	–	25	25	25	25	25	
		31.5	31.5	–	31.5	31.5	31.5	31.5	31.5	
Making capacity	Ip [kA]	–	–	40	–	40	40	40	40	
		–	–	50	–	50	50	50	50	
		40	40	–	40	–	–	–	–	
		63	63	–	63	63	63	63	63	
		80	80	–	80	80	80	80	80	
		–	–	100	–	100	100	100	100	
		–	–	125	–	125	125	125	125	
		Operation sequence [O-0.3s-CO-15s-CO] •								
		Opening time	[ms]	35-60						
Arcing time	[ms]	10-15								
Total breaking time	[ms]	45-75								
Closing time	[ms]	≤85								
Overall dimensions		H [mm]	623	655	649	655				
		W [mm]	618	618	618	730				
		D [mm]	446	561	561	603				
		Pole centre distance l [mm]	210	210	210	275				
Weight	[Kg]	114	145	114	165					
Standardised table of dimensions		1VCD000231	TN 7163	TN 7178	TN 7165					
Absolute SF ₆ gas pressure ⁽²⁾	[kPa]	380 (430 a 31.5 kA)		380	380					
Operating temperature	[°C]	- 5 ... + 40 °C								
Tropicalization	IEC: 60068-2-30, 60721-2-1 •									
Electromagnetic compatibility	IEC 62271-1 •									

(1) Rated normal current defined in free air.

(2) Rated service value.

(3) Including insulating shields (available on request).

Selection and ordering

General characteristics
of fixed circuit breakers (24 kV)



Circuit breaker		HD4 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 normal current (40 °C) ⁽¹⁾	Ir [A]	630	1250	630	1250	1600	1600	2000	2500	3150	3600	
		16	16	16	16	–	16	–	–	–	–	
		20	20	20	20	–	20	–	–	–	–	
Rated breaking capacity	Isc [kA]	25	25	25	25	25	25	25	25	25	25	
		–	–	–	–	31.5	–	31.5	31.5	31.5	31.5	
		–	–	–	–	40	–	40	40	40	40	
		16	16	16	16	–	16	–	–	–	–	
Rated short-time withstand current (3 s)	Ik [kA]	20	20	20	20	–	20	–	–	–	–	
		25	25	25	25	25	25	25	25	25	25	
		–	–	–	–	31.5	–	31.5	31.5	31.5	31.5	
		–	–	–	–	40	–	40	40	40	40	
Making capacity	Ip [kA]	40	40	40	40	–	40	–	–	–	–	
		50	50	50	50	–	50	–	–	–	–	
		63	63	63	63	63	63	63	63	63	63	
		–	–	–	–	80	–	80	80	80	80	
–	–	–	–	100	–	100	100	100	100	100		
Operation sequence	[O-0.3s-CO-15s-CO] •											
Opening time	[ms]	35-60										
Arcing time	[ms]	10-15										
Total breaking time	[ms]	45-75										
Closing time	[ms]	≤85										
Overall dimensions		H [mm]	818	730	655	818	818 ⁽³⁾					
		W [mm]	618	748	730	618	730					
		D [mm]	600	496	561	600	620 ⁽³⁾					
		Pole centre distance l [mm]	210	275	275	210	275					
Weight	[Kg]	119	119	145	114	165						
Standardised table of dimensions		1VCD000235	1VCD000237	TN 7174	TN 7179	TN 7165						
Absolute SF ₆ gas pressure ⁽²⁾	[kPa]	380				380 (480 to 25 kA and 40 kA)						
Operating temperature	[°C]	- 5 ... + 40 °C										
Tropicalization	IEC: 60068-2-30, 60721-2-1 •											
Electromagnetic compatibility	IEC 62271-1 •											

(1) Rated normal current defined in free air.

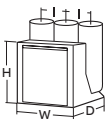
(2) Rated service value.

(3) Including insulating shields (available on request).

General characteristics of fixed circuit breakers (36 kV)



Circuit breaker	HD4 36			HD4 36				
Standards	IEC 62271-100 •							
Rated voltage	Ur [kV]	36			36			
Rated insulation voltage	Us [kV]	36			36			
Withstand voltage at 50 Hz	Ud (1 min) [kV]	70			70			
Impulse withstand voltage	Up [kV]	170			170			
Rated frequency	fr [Hz]	50-60			50-60			
Rated normal current (40 °C) ⁽¹⁾	Ir [A]	630	1250	1600	1250 ⁽³⁾	1600 ⁽³⁾	2000 ⁽³⁾	2500 ⁽³⁾
Rated breaking capacity	Isc [kA]	16	16	16	–	–	–	–
		20 ⁽⁵⁾	20 ⁽⁵⁾	20 ⁽⁵⁾	–	–	20	20
		–	–	–	25	25	25	25
		–	–	–	31.5	31.5	31.5	31.5
Rated short-time withstand current (3 s)	Ik [kA]	16	16	16	–	–	–	–
		20	20	20	–	–	20	20
		–	–	–	25	25	25	25
		–	–	–	31.5	31.5	31.5	31.5
Making capacity	Ip [kA]	40	40	40	–	–	–	–
		50	50	50	–	–	50	50
		–	–	–	63	63	63	63
		–	–	–	80	80	80	80
Operation sequence	[O-0.3s-CO-15s-CO]							
	[O-0.3s-CO-3min-CO] • • • • • • •							
Opening time	[ms]	45			45			
Arcing time	[ms]	10-15			10-15			
Total breaking time	[ms]	55-60			55-60			
Closing time	[ms]	80			80			
Maximum overall dimensions without insulating screens between phases ⁽⁴⁾	H [mm]	730/1060 ⁽⁶⁾			790/1123 ⁽⁶⁾		790/1123 ⁽⁶⁾	
	W [mm]	880/955 ⁽⁶⁾			748/805 ⁽⁶⁾		748/805 ⁽⁶⁾	
	D [mm]	695			833		833	
	Pole centre distance I [mm]	350			275		275	
Weight	[kg]	124	128	128	175	175	180	190
Standardised table of dimensions		TN 7241			TN 7268		TN 7315	
Absolute SF ₆ gas pressure ⁽²⁾	[kPa]	380			450		450	
Operating temperature	[°C]	- 5 ... + 40			- 5 ... + 40			
Tropicalizzazione	IEC: 60068-2-30, 60721-2-1	•			•			
Electromagnetic compatibility	IEC 62271-1	•			•			



(1) Rated normal current defined in free air

(2) Rated service value

(3) For these versions, with 275 mm pole centre distance, special insulating partitions are provided (on request)

(4) For the dimensions of the insulating partitions (available on request), see the standardised table in chapter 5

(5) Operation sequence: O - 0.3 min - CO - 3 min - CO

(6) The second distance refers to the circuit breaker with truck (available on request)

Fixed HD4 36 kV circuit breaker with 350 mm pole centre distance:
Ir = 630-1250-1600 A;
Isc = 16-20 kA.

Fixed HD4 36 kV circuit breaker with 275 mm pole centre distance:
Ir = 1250-1600 A;
Isc = 25-31.5 kA;
Ir = 2000-2500 A;
Isc = 20-25-31.5 kA.

Selection and ordering

General characteristics of withdrawable circuit breakers for UniGear type ZS1 switchgear (12 kV) ⁽⁴⁾



Circuit breaker		HD4/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 normal current (40 °C) ⁽¹⁾	Ir [A]	630	1250	1250	1600	2000	2500	3150 ⁽³⁾
		16	16	–	–	–	–	–
Rated Breaking capacity	Isc [kA]	25	25	–	25	25	25	25
		31.5	31.5	–	31.5	31.5	31.5	31.5
		–	–	40	40	40	40	40
		–	–	–	50	50	50	50
		16	16	–	–	–	–	–
Rated short-time withstand current (3s)	Ik [kA]	25	25	–	25	25	25	25
		31.5	31.5	–	31.5	31.5	31.5	31.5
		–	–	40	40	40	40	40
		–	–	–	50	50	50	50
Making capacity	Ip [kA]	40	40	–	–	–	–	–
		63	63	–	63	63	63	63
		80	80	–	80	80	80	80
		–	–	100	100	100	100	100
		–	–	–	125	125	125	125
Operation sequence	[O-0.3s-CO-15s-CO] •							
Opening time	[ms]	35-60						
Arcing time	[ms]	10-15						
Total breaking time	[ms]	45-75						
Closing time	[ms]	≤85						
Overall dimensions		H [mm]	633	702	702	702	746	
		W [mm]	531	682	682	882	882	
		D [mm]	661	640	640	643	643	
		Pole centre distance I [mm]	150	210	210	275	275	
		Weight	[kg]	120	177	177	220	230
Standardised table of dimensions		1VCD000227	TN 7350	TN 7351	TN 7352	TN7371		
Absolute SF ₆ gas pressure ⁽²⁾	[kPa]	380 (430 to 31.5 kA)		380				
Operating temperature	[°C]	- 5 ... + 40						
Tropicalization	IEC: 60068-2-30, 60721-2-1 •							
Electromagnetic compatibility	IEC 62271-1 •							

(1) Rated normal current with circuit breaker in UniGear type ZS1 switchgear and 40 °C ambient temperature outside the switchgear

(2) Rated service value

(3) The circuit breaker can reach rated currents higher than 3150 A with appropriate forced ventilation of the switchgear (for further information, consult the technical catalogue of the UniGear type ZS1 switchgear).

(4) In the standard fitting, the truck locking electromagnetic (-RL2) is included to prevent circuit breaker racking-in with auxiliary circuits not connected (plug not inserted in the socket).

(5) Rated current in switchgear with forced ventilation; with natural ventilation the rated current is 2300 A.

General characteristics of withdrawable circuit breakers for UniGear type ZS1 switchgear (17.5 kV) ⁽⁴⁾



Circuit breaker		HD4/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 normal current (40 °C) ⁽¹⁾	Ir [A]	630	1250	1250	1600	2000	2500	3150 ⁽³⁾
		16	16	–	–	–	–	–
Rated Breaking capacity	Isc [kA]	25	25	–	25	25	25	25
		31.5	31.5	–	31.5	31.5	31.5	31.5
		–	–	40	40	40	40	40
		–	–	–	50	50	50	50
		16	16	–	–	–	–	–
Rated short-time withstand current (3s)	Ik [kA]	25	25	–	25	25	25	25
		31.5	31.5	–	31.5	31.5	31.5	31.5
		–	–	40	40	40	40	40
		–	–	–	50	50	50	50
		40	40	–	–	–	–	–
Making capacity	Ip [kA]	63	63	–	63	63	63	63
		80	80	–	80	80	80	80
		–	–	100	100	100	100	100
		–	–	–	125	125	125	125
		40	40	–	–	–	–	–
Operation sequence	[O-0.3s-CO-15s-CO] •							
Opening time	[ms]	35-60						
Arcing time	[ms]	10-15						
Total breaking time	[ms]	45-75						
Closing time	[ms]	≤85						
Overall dimensions		H [mm]	633	702	702	702	746	
		W [mm]	531	682	682	882	882	
		D [mm]	661	640	640	643	643	
		Pole centre distance I [mm]	150	210	210	275	275	
		Weight	[kg]	120	177	177	220	230
Standardised table of dimensions	1VCD000227		TN 7350	TN 7351	TN 7352	TN7371		
Absolute SF ₆ gas pressure ⁽²⁾	[kPa]	380 (430 to 31.5 kA)		380				
Operating temperature	[°C]	- 5 ... + 40						
Tropicalization	IEC: 60068-2-30, 60721-2-1 •							
Electromagnetic compatibility	IEC 62271-1 •							

(1) Rated normal current with circuit breaker in UniGear type ZS1 switchgear and 40 °C ambient temperature outside the switchgear

(2) Rated service value

(3) The circuit breaker can reach rated currents higher than 3150 A with appropriate forced ventilation of the switchgear (for further information, consult the technical catalogue of the UniGear type ZS1 switchgear).

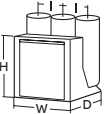
(4) In the standard fitting, the truck locking electromagnetic (-RL2) is included to prevent circuit breaker racking-in with auxiliary circuits not connected (plug not inserted in the socket).

(5) Rated current in switchgear with forced ventilation; with natural ventilation the rated current is 2300 A.

Selection and ordering

General characteristics of withdrawable circuit breakers for UniGear type ZS1 switchgear (24 kV) ⁽⁴⁾



Circuit breaker	HD4/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 normal current (40 °C) ⁽¹⁾	Ir [A]	630	1250	1250	1600	2000	2500 ⁽⁵⁾
		16	–	–	16	16	–
Rated breaking capacity	Isc [kA]	20	20	–	20	20	20
		25	25	–	25	25	25
		–	–	31.5	31.5	31.5	31.5
		16	–	–	16	16	–
Rated short-time withstand current (3s)	Ik [kA]	20	20	–	20	20	20
		25	25	–	25	25	25
		–	–	31.5	31.5	31.5	31.5
		40	–	–	40	40	–
Making capacity	Ip [kA]	50	50	–	50	50	50
		63	63	–	63	63	63
		–	–	80	80	80	80
		–	–	–	–	–	–
Operation sequence	[O-0.3s-CO-15s-CO] •						
Opening time	[ms]	35-60					
Arcing time	[ms]	10-15					
Total breaking time	[ms]	45-75					
Closing time	[ms]	≤85					
Overall dimensions 	H [mm]	736	792	821	821		
	W [mm]	636	653	842	842		
	D [mm]	799	799	788	788		
	Pole centre distance l [mm]	210	210	275	275		
Weight	[kg]	125	177	177	220		
Standardised table of dimensions		1VCD000236	1VCD000099	TN 7355	TN 7356		
Absolute SF ₆ gas pressure ⁽²⁾	[kPa]	380	380	380 (480 to 25 kA and 40 kA)			
Operating temperature	[°C]	- 5 ... + 40					
Tropicalization	IEC: 60068-2-30, 60721-2-1 •						
Electromagnetic compatibility	IEC 62271-1 •						

(1) Rated normal current with circuit breaker in UniGear type ZS1 switchgear and 40 °C ambient temperature outside the switchgear

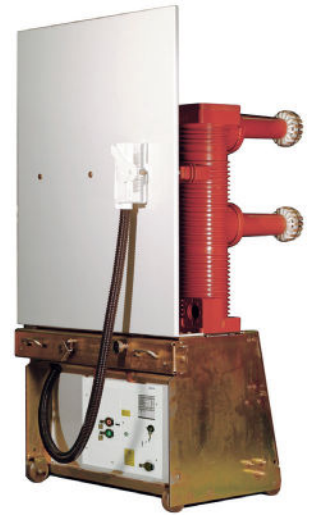
(2) Rated service value

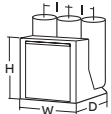
(3) The circuit breaker can reach rated currents higher than 3150 A with appropriate forced ventilation of the switchgear (for further information, consult the technical catalogue of the UniGear type ZS1 switchgear).

(4) In the standard fitting, the truck locking electromagnetic (-RL2) is included to prevent circuit breaker racking-in with auxiliary circuits not connected (plug not inserted in the socket).

(5) Rated current in switchgear with forced ventilation; with natural ventilation the rated current is 2300 A.

General characteristics of withdrawable circuit breakers
for UniGear type ZS3.2 switchgear (40.5 kV)



Circuit breaker		HD4/Z 40.5			
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			
Rated frequency	fr [Hz]	50-60			
Rated normal current (40 °C) ⁽¹⁾	Ir [A]	1250	1600	2000	2500 ⁽³⁾
Rated breaking capacity	Isc [kA]	25	25	25	25
		31.5 ⁽⁴⁾	31.5 ⁽⁴⁾	31.5 ⁽⁴⁾	31.5 ⁽⁴⁾
Rated short-time withstand current (3s)	Ik [kA]	25	25	25	25
		31.5	31.5	31.5	31.5
Making capacity	Ip [kA]	63	63	63	63
		80	80	80	80
Operation sequence	[O-0.3s-CO-15s-CO] •				
Opening time	[ms]	45			
Arcing time	[ms]	10-15			
Total breaking time	[ms]	55-60			
Closing time	[ms]	80			
Overall dimensions		H [mm]	1575		
		W [mm]	850		
		D [mm]	686		
		Pole centre distance l [mm]	280		
Weight	[kg]	280			
Standardised table of dimensions	TN 7227				
Absolute SF ₆ gas pressure ⁽²⁾	[kPa]	550			
Operating temperature	[°C]	- 5 ... + 40			
Tropicalization	IEC: 60068-2-30, 60721-2-1 •				
Electromagnetic compatibility	IEC 62271-1 •				

(1) Rated normal current with circuit breaker in switchgear UniGear ZS3.2 and ambient temperature outside the switchgear 40 °C

(2) Rated service value

(3) Rated current in ZS3.2 switchgear with forced ventilation; in Powerbloc enclosure the 2500 A rated current is guaranteed with natural ventilation.

(4) The operation sequence becomes O-0.3-CO-3min-CO for the I_{sc} = 31.5 kA performance.

Selection and ordering

General characteristics of withdrawable circuit breakers for PowerCube units (12 kV)



Circuit breaker	HD4/P 12		HD4/W 12				HD4/P 12					
	PowerCube module	PB1	PB1	PB2	PB2	PB2	PB2	PB2	PB3	PB2	PB2	PB3
Standards	IEC 62271-100	•	•	•	•	•	•	•	•	•	•	•
Rated voltage	Ur [kV]	12	12	12	12	12	12	12	12	12	12	12
Rated insulation voltage	Us [kV]	12	12	12	12	12	12	12	12	12	12	12
Withstand voltage at 50 Hz	Ud (1 min) [kV]	28	28	28	28	28	28	28	28	28	28	28
Impulse withstand voltage	Up [kV]	75	75	75	75	75	75	75	75	75	75	75
Rated frequency	fr [Hz]	50-60	50-60	50-60	50-60	50-60	50-60	50-60	50-60	50-60	50-60	50-60
Rated normal current (40 °C) ⁽¹⁾	Ir [A]	630	1250	630	1250	1250	1600	2000	3150 ⁽³⁾	1600	2000	2500
		16	16	16	16	—	16	16	—	—	—	—
Rated breaking capacity	Isc [kA]	25	25	25	25	—	25	25	—	—	—	25
		31.5	31.5	31.5	31.5	—	31.5	31.5	31.5	—	—	31.5
		—	—	—	—	40	—	—	40	40	40	40
		—	—	—	—	50	—	—	50	50	50	50
Rated short-time withstand current (3s)	Ik [kA]	16	16	16	16	—	16	16	—	—	—	—
		25	25	25	25	—	25	25	—	—	—	25
		31.5	31.5	31.5	31.5	—	31.5	31.5	31.5	—	—	31.5
		—	—	—	—	40	—	—	40	40	40	40
		—	—	—	—	50	—	—	50	50	50	50
Making capacity	Ip [kA]	40	40	40	40	—	40	40	—	—	—	—
		63	63	63	63	—	63	63	—	—	—	63
		80	80	80	80	—	80	80	80	—	—	80
		—	—	—	—	100	—	—	100	100	100	100
		—	—	—	—	125	—	—	125	125	125	125
Operation sequence	[O-0.3s-CO-15s-CO]	•	•	•	•	•	•	•	•	•	•	
Opening time	[ms]	35-60	35-60	35-60	35-60	35-60	35-60	35-60	35-60	35-60	35-60	
Arcing time	[ms]	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	
Total breaking time	[ms]	45-75	45-75	45-75	45-75	45-75	45-75	45-75	45-75	45-75	45-75	
Closing time	[ms]	≤85	≤85	≤85	≤85	≤85	≤85	≤85	≤85	≤85	≤85	
Overall dimensions		H [mm]	633	702	702	702	702	742	702	702	702	
		W [mm]	531	681	681	681	681	882	682	682	882	
		D [mm]	661	640	640	640	640	643	640	640	643	
		Pole centre distance l [mm]	150	210	210	210	210	275	210	210	275	
Weight	[kg]	120	120	177	177	230	177	177	220	220	220	
Standardised table of dimensions	1VCD	000227	000228	000053	000053	000053	000053	000053	000053	000053	000053	
	TN	7421	7239	7350	7351	7352	7350	7351	7352	7350	7351	7352
Absolute SF ₆ gas pressure ⁽²⁾	[kPa]	380 (430 to 31.5 kA)	380	380	380	380	380	380	380	380	380	
Operating temperature	[°C]	- 5 ... + 40	- 5 ... + 40	- 5 ... + 40	- 5 ... + 40	- 5 ... + 40	- 5 ... + 40	- 5 ... + 40	- 5 ... + 40	- 5 ... + 40	- 5 ... + 40	
Tropicalization	IEC: 60068-2-30, 60721-2-1	•	•	•	•	•	•	•	•	•	•	
Electromagnetic compatibility	IEC 62271-1	•	•	•	•	•	•	•	•	•	•	

(1) Rated normal current with withdrawable circuit breaker in switchgear

(2) Rated service value

(3) There are higher currents with forced ventilation: 3600 A with a fan installed in the PB3 and 4000 A with a further fan in the rear of the switchgear (provided by the customer); see the PowerCube Instruction Manual

(4) 2500 A with forced ventilation

(5) 480 to 25 kA and 40 kA

General characteristics of withdrawable circuit breakers for PowerCube units (17.5 kV)



Circuit breaker	HD4/P 17		HD4/W 17					HD4/P 17				
	PB1	PB1	PB2	PB2	PB2	PB2	PB2	PB3	PB2	PB2	PB3	
Standards	IEC 62271-100		•	•					•			
Rated voltage	Ur [kV]	17.5	17.5					17.5				
Rated insulation voltage	Us [kV]	17.5	17.5					17.5				
Withstand voltage at 50 Hz	Ud (1 min) [kV]	38	38					38				
Impulse withstand voltage	Up [kV]	95	95					95				
Rated frequency	fr [Hz]	50-60	50-60					50-60				
Rated normal current (40 °C) ⁽¹⁾	Ir [A]	630	1250	630	1250	1250	1600	2000	3150 ⁽³⁾	1600	2000	2500
		16	16	16	16	—	16	16	—	—	—	—
		25	25	25	25	—	25	25	—	—	—	25
		31.5	31.5	31.5	31.5	—	31.5	31.5	31.5	—	—	31.5
		—	—	—	—	40	—	—	40	40	40	40
Rated breaking capacity	Isc [kA]	—	—	—	—	50	—	—	50	50	50	
		—	—	—	—	—	—	—	—	—	—	
		16	16	16	16	—	16	16	—	—	—	
		25	25	25	25	—	25	25	—	—	25	
		31.5	31.5	31.5	31.5	—	31.5	31.5	31.5	—	—	31.5
Rated short-time withstand current (3s)	Ik [kA]	—	—	—	—	40	—	—	40	40	40	
		—	—	—	—	50	—	—	50	50	50	
		40	40	40	40	—	40	40	—	—	—	
		63	63	63	63	—	63	63	—	—	63	
		80	80	80	80	—	80	80	80	—	—	80
Making capacity	Ip [kA]	—	—	—	—	100	—	—	100	100	100	
		—	—	—	—	125	—	—	125	125	125	
		40	40	40	40	—	40	40	—	—	—	
		63	63	63	63	—	63	63	—	—	63	
		80	80	80	80	—	80	80	80	—	—	80
Operation sequence	[O-0.3s-CO-15s-CO]	•	•					•				
Opening time	[ms]	35-60		35-60					35-60			
Arcing time	[ms]	10-15		10-15					10-15			
Total breaking time	[ms]	45-75		45-75					45-75			
Closing time	[ms]	≤85		≤85					≤85			
Overall dimensions		H [mm]	633	702					702	702	702	
		W [mm]	531	681					682	682	882	682
		D [mm]	661	640					640	640	643	640
		Pole centre distance l [mm]	150	210					210	210	275	210
Weight	[kg]	120	120	177	177	230	177	177	220			
Standardised table of dimensions	1VCD	000227		000228					000053			
	TN						7421	7239	7350	7351	7352	
Absolute SF ₆ gas pressure ⁽²⁾	[kPa]	380 (430 to 31.5 kA)					380					
Operating temperature	[°C]	- 5 ... + 40					- 5 ... + 40					
Tropicalization	IEC: 60068-2-30, 60721-2-1	•					•					
Electromagnetic compatibility	IEC 62271-1	•					•					

(1) Rated normal current with withdrawable circuit breaker in switchgear

(2) Rated service value

(3) There are higher currents with forced ventilation: 3600 A with a fan installed in the PB3 and 4000 A with a further fan in the rear of the switchgear (provided by the customer); see the PowerCube Instruction Manual

(4) 2500 A with forced ventilation

(5) 480 to 25 kA and 40 kA

Selection and ordering

General characteristics of withdrawable circuit breakers for PowerCube units (24 kV)



Circuit breaker	HD4/P 24		HD4/P 24				
	PB4	PB4	PB4	PB5	PB5	PB5	
Standards	IEC 62271-100		•	•	•		
Rated voltage	Ur [kV]	24	24	24			
Rated insulation voltage	Us [kV]	24	24	24			
Withstand voltage at 50 Hz	Ud (1 min) [kV]	50	50	50			
Impulse withstand voltage	Up [kV]	125	125	125			
Rated frequency	fr [Hz]	50-60	50-60	50-60			
Rated normal current (40 °C) ⁽¹⁾	Ir [A]	630	1250	1250	1600	2000	2500 ⁽⁴⁾
		16	16	—	16	16	16
		20	20	—	20	20	20
		25	25	—	25	25	25
Rated breaking capacity	Isc [kA]	—	—	31.5	31.5	31.5	31.5
		—	—	40	40	40	40
		16	16	—	16	16	16
		20	20	—	20	20	20
Rated short-time withstand current (3s)	Ik [kA]	25	25	—	25	25	25
		—	—	31.5	31.5	31.5	31.5
		—	—	40	40	40	40
		40	40	—	40	40	40
Making capacity	Ip [kA]	50	50	—	50	50	50
		63	63	—	63	63	63
		—	—	80	80	80	80
		—	—	100	100	100	100
Operation sequence	[O-0.3s-CO-15s-CO]	•	•	•			
Opening time	[ms]	35-60	35-60	35-60			
Arcing time	[ms]	10-15	10-15	10-15			
Total breaking time	[ms]	45-75	45-75	45-75			
Closing time	[ms]	≤85	≤85	≤85			
		H [mm]	792	792	821	821	
Maximum overall dimensions	W [mm]	682	641	842	842		
	D [mm]	799	799	788	788		
	Pole centre distance l [mm]	210	210	275	275		
Weight	[kg]	125	177	177	220		
Standardised table of dimensions		1VCD000236	1VCD000099	TN 7355	TN 7356		
Absolute SF ₆ gas pressure ⁽²⁾	[kPa]	380	380	380 ⁽⁵⁾			
Operating temperature	[°C]	- 5 ... + 40	- 5 ... + 40	- 5 ... + 40			
Tropicalization	IEC: 60068-2-30, 60721-2-1	•	•	•			
Electromagnetic compatibility	IEC 62271-1	•	•	•			

(1) Rated normal current with withdrawable circuit breaker in switchgear

(2) Rated service value

(3) There are higher currents with forced ventilation: 3600 A with a fan installed in the PB3 and 4000 A with a further fan in the rear of the switchgear (provided by the customer); see the PowerCube Instruction Manual

(4) 2500 A with forced ventilation

(5) 480 to 25 kA and 40 kA

General characteristics of withdrawable circuit breakers for PowerCube units (36 kV) and UniGear type ZS2 switchgear (36 kV)



Circuit breaker		HD4/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]	50-60							
Rated normal current (40 °C) ⁽¹⁾	Ir [A]	1250	1250	1600	1600	2000	2000	2500 ⁽³⁾	2500 ⁽³⁾
	Isc [kA]	20	—	20	—	20	—	20	—
Rated breaking capacity		25	—	25	—	25	—	25	—
		—	31.5	—	31.5	—	31.5	—	31.5
Rated short-time withstand current (3s)	Ik [kA]	20	—	20	—	20	—	20	—
		25	—	25	—	25	—	25	—
Making capacity		—	31.5	—	31.5	—	31.5	—	31.5
	I _p [kA]	50	—	50	—	50	—	50	—
Operation sequence		63	—	63	—	63	—	63	—
		—	80	—	80	—	80	—	80
Opening time	[O-0.3s-CO-3min-CO]	•	•		•		•		•
	[O-0.3s-CO-15s-CO]			•		•		•	
Arcing time	[ms]	10-15							
Total breaking time	[ms]	55-60							
Closing time	[ms]	80							
Maximum overall dimensions	H [mm]	973	973	973				973	
	W [mm]	882	882	882				882	
	D [mm]	788	788	789				789	
	Pole centre distance l [mm]	275	275	275				275	
Weight	[kg]	130	225	225				270	
Standardised table of dimensions		TN 7402	TN 7316	TN 7317				TN 7317	
Absolute SF ₆ gas pressure ⁽²⁾	[kPa]	450							
Operating temperature	[°C]	- 5 ... + 40							
Tropicalization	IEC: 60068-2-30, 60721-2-1 •								
Electromagnetic compatibility	IEC 62271-1 •								

(1) Rated normal current with circuit breaker in UniGear ZS2 switch-gear and 40 °C ambient temperature outside the switchgear

(2) Rated service value

(3) Switchgear with forced ventilation

Selection and ordering

General characteristics of withdrawable circuit breakers for UniSec (12 -17.5 - 24 kV) type units WBC



Circuit breaker		HD4/P 12	HD4/P 17	HD4/SEC 24	
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 normal current (40 °C) ⁽¹⁾	Ir [A]	630-1250	630-1250	630-1250	
Rated breaking capacity	Isc [kA]	16	16	16	
		20	20	20	
		25	25	–	
Rated short-time withstand current	Ik [kA]	16	16	16	
		20	20	20	
		25	25	–	
Making capacity	Ip [kA]	40	40	40	
		50	50	50	
		63	63	–	
Operation sequence	[O-0.3s-CO-15s-CO]	•	•	•	
Opening time	[ms]	35-60	35-60	35-60	
Arcing time	[ms]	10-15	10-15	10-15	
Total breaking time	[ms]	55-60	55-60	55-60	
Closing time	[ms]	≤85	≤85	≤85	
Maximum overall dimensions		H [mm]	633	633	800
		W [mm]	531	531	682
		D [mm]	661	661	739
		Pole centre distance l [mm]	150	150	210
Truck run	[mm]	200	200	200	
Weight	[kg]	120	120	123	
Standardised table of dimensions		1VCD000227	1VCD000227	1VCD000220	
Absolute SF ₆ gas pressure ⁽²⁾	[kPa]	380	380	380	
Operating temperature	[°C]	- 5 ... + 40	- 5 ... + 40	- 5 ... + 40	
Tropicalization	IEC: 60068-2-30, 60721-2-1	•	•	•	
Electromagnetic compatibility	IEC 62271-1	•	•	•	

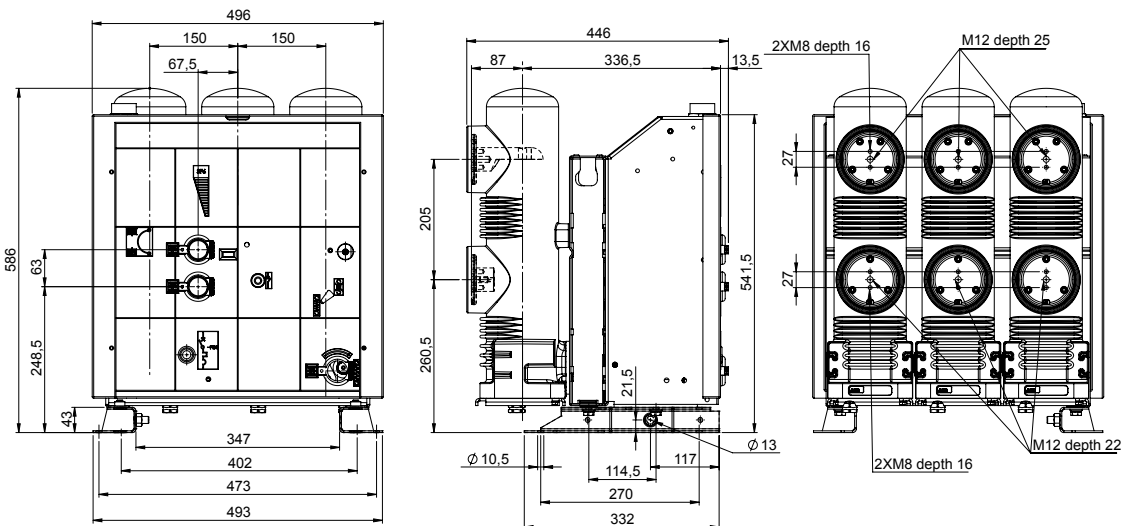
(1) Rated normal current with withdrawable circuit breaker in switchgear

(2) Rated service value

Overall dimensions

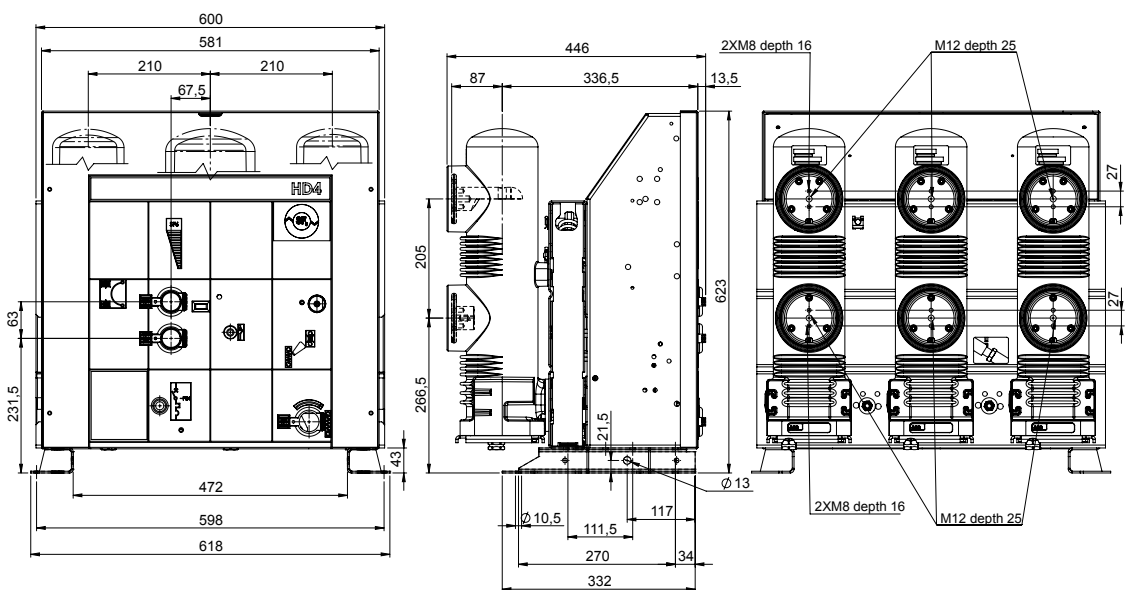
Fixed circuit breakers

HD4		
TN	1VCD000226	
Ur	12	kV
Ir	630	A
	1250	A
Isc	16	kA
	25	kA
	31.5	kA



Fixed circuit breakers

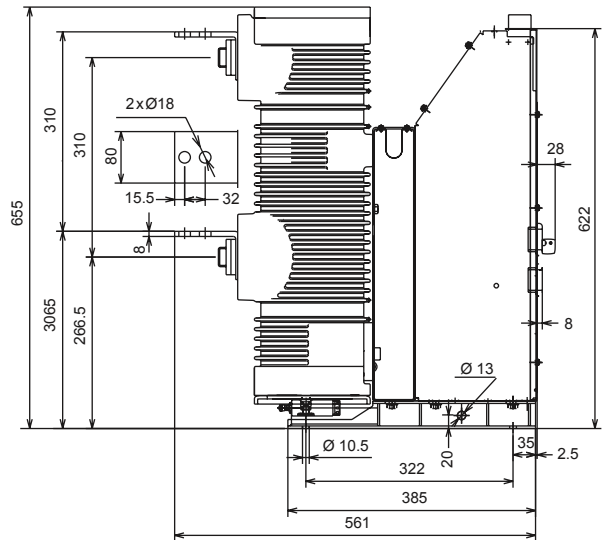
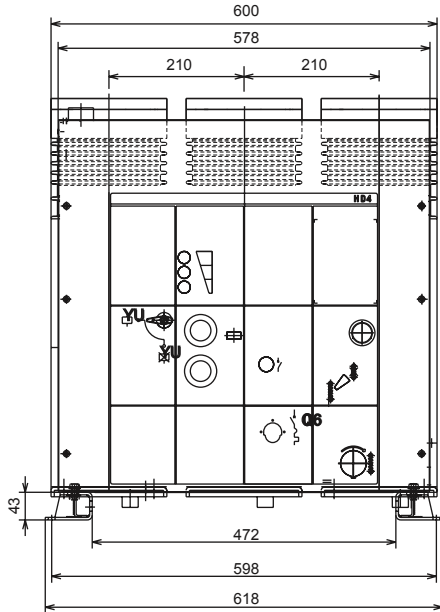
HD4		
TN	1VCD000231	
Ur	12	kV
	17.5	kV
Ir	630	A
	1250	A
Isc	16	kA
	25	kA
	31.5	kA



Fixed circuit breakers

HD4		
TN	7163	
Ur	12	kV
	17.5	kV
Ir	1600	A
	40	kA
Isc	40	kA
	50	kA

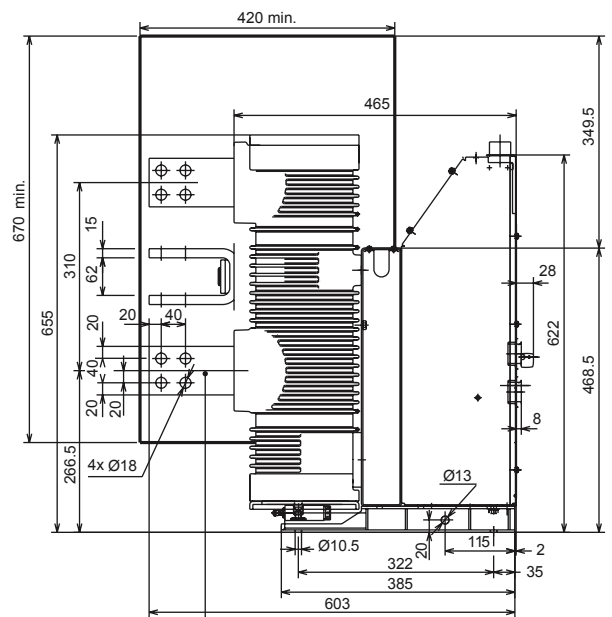
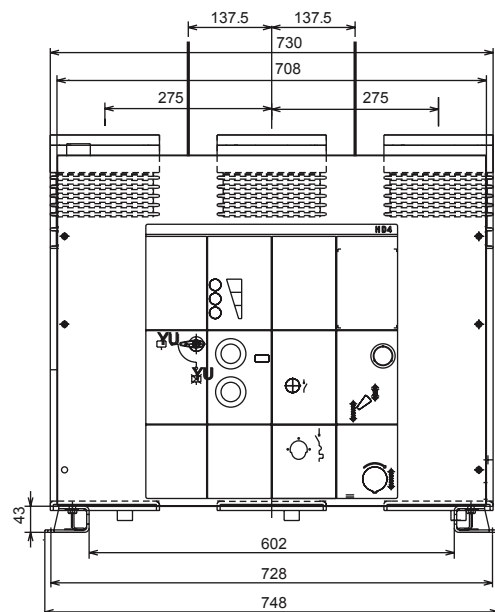
HD4		
TN	7163	
Ur	12	kV
	17.5	kV
Ir	2000	A
	25	kA
Isc	31.5	kA
	40	kA
	50	kA



Fixed circuit breakers

HD4		
TN	7165	
Ur	12	kV
	17.5	kV
Ir	2500	A
	3150	A
Isc	3600	A
	25	kA
	31.5	kA
	40	kA
	50	kA

HD4		
TN	7165	
Ur	24 kV	
Ir	2500	A
	3150	A
Isc	3600	A
	25	kA
	31.5	kA
	40	kA

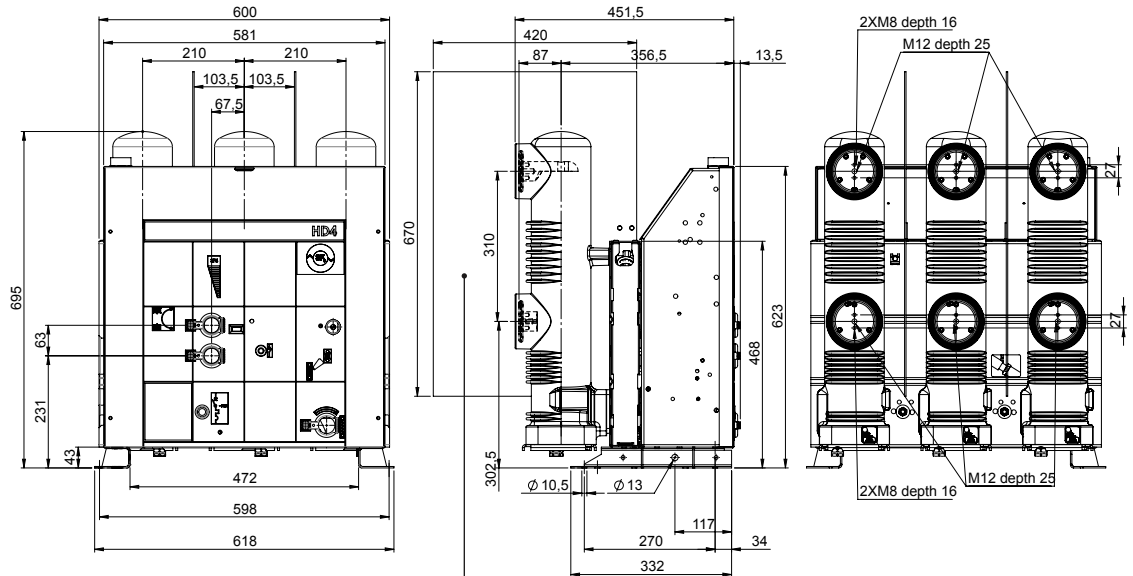


Insulating partitions (only for 24 kV) to be provided by the customer (a special kit is available on request).

Overall dimensions

Fixed circuit breakers

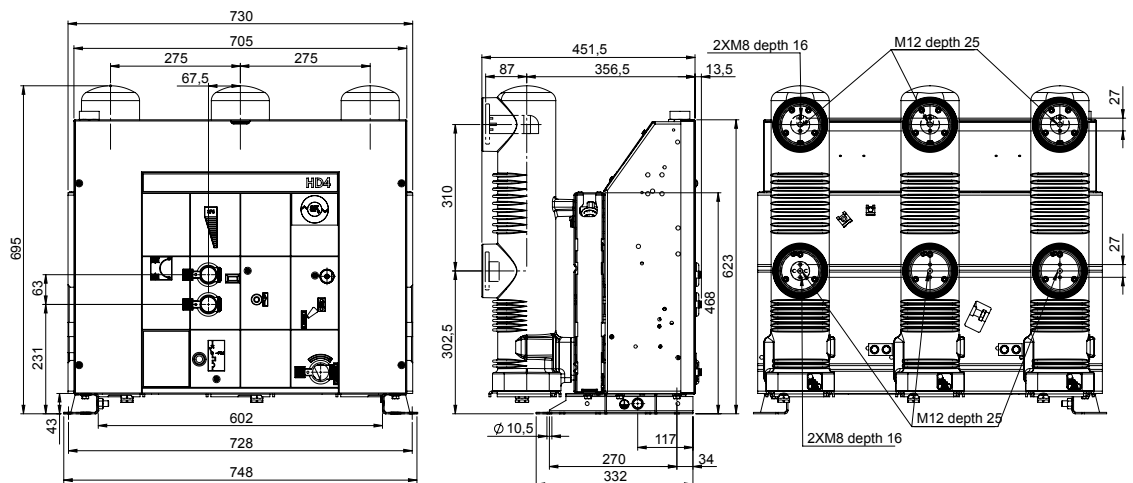
HD4		
TN	1VCD000235	
Ur	24	kV
Ir	630	A
	1250	A
Isc	16	kA
	20	kA
	25	kA



Insulating partitions to be provided by the customer
(a special kit is available on request).

Fixed circuit breakers

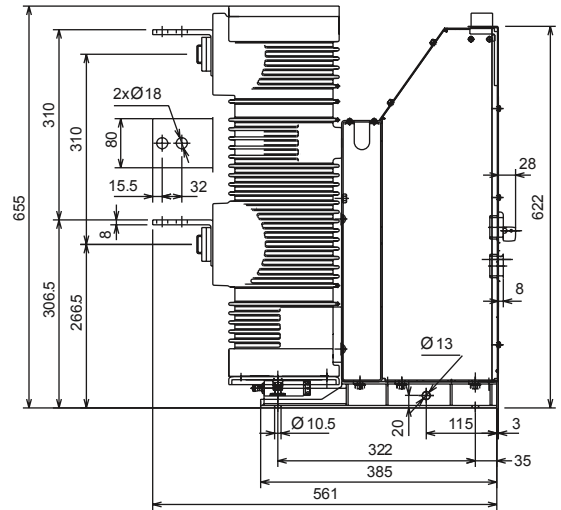
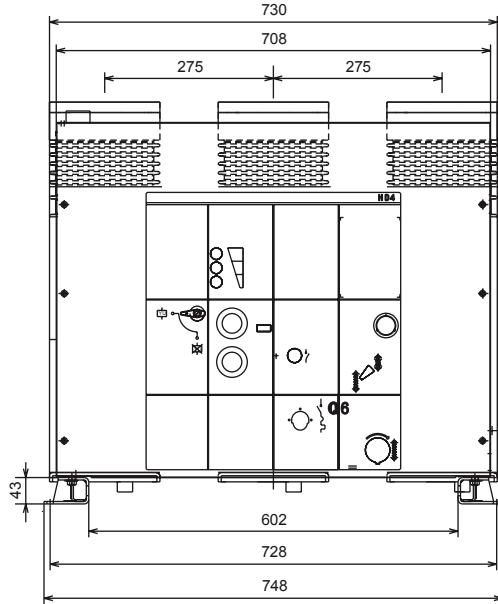
HD4		
TN	1VCD000237	
Ur	24	kV
Ir	630	A
	1250	A
Isc	16	kA
	20	kA
	25	kA



Fixed circuit breakers

HD4		
TN	7174	
Ur	24	kV
Ir	1600	A
Isc	31.5	kA
	40	kA

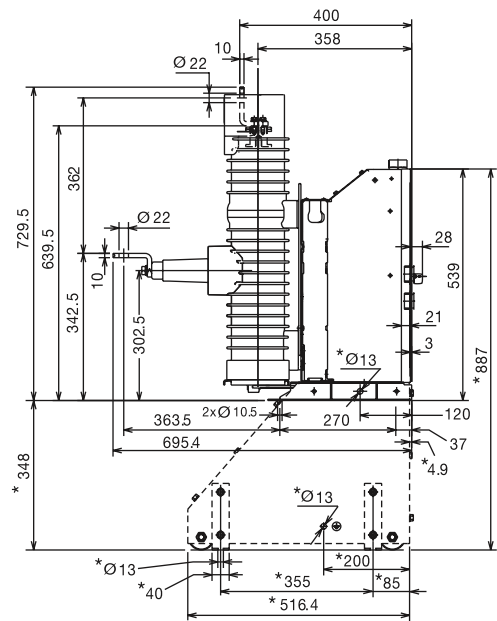
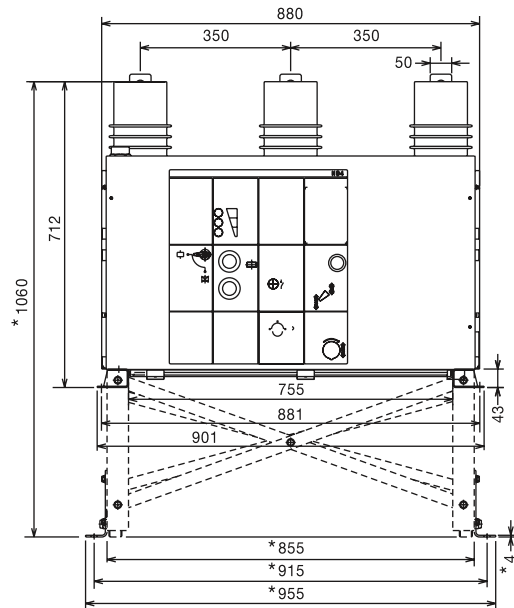
HD4		
TN	7174	
Ur	24	kV
Ir	2000	A
Isc	25	kA
	31.5	kA
	40	kA



Fixed circuit breakers

HD4 with truck (on request)		
TN	7241	
Ur	36	kV
Ir	630	A
	1250	A
	1600	A
Isc	16	kA
	20	kA

* Distance with truck (if provided).

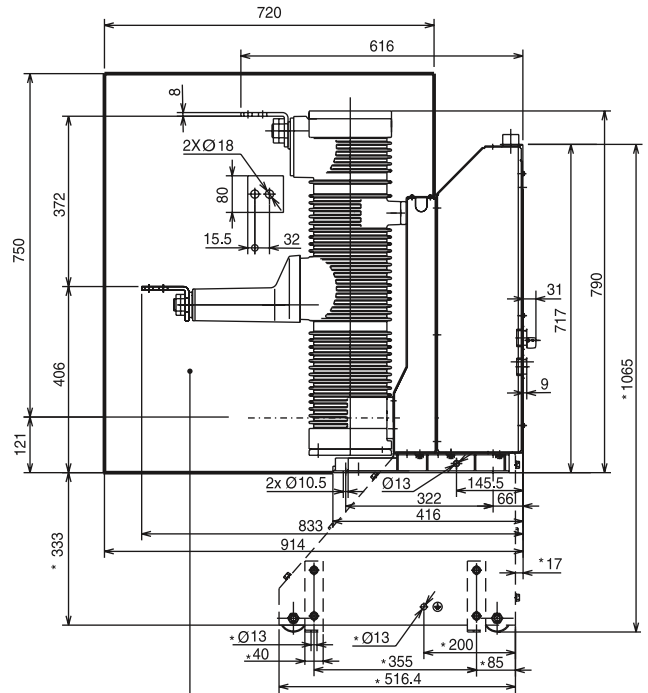
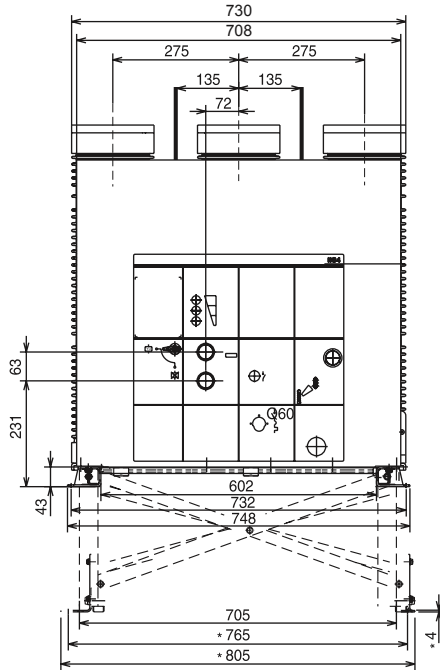


Overall dimensions

Fixed circuit breakers

HD4	
with truck	
(on request)	
TN	7268
Ur	36 kV
	1250 A
Ir	1600 A
	25 kA
Isc	31.5 kA

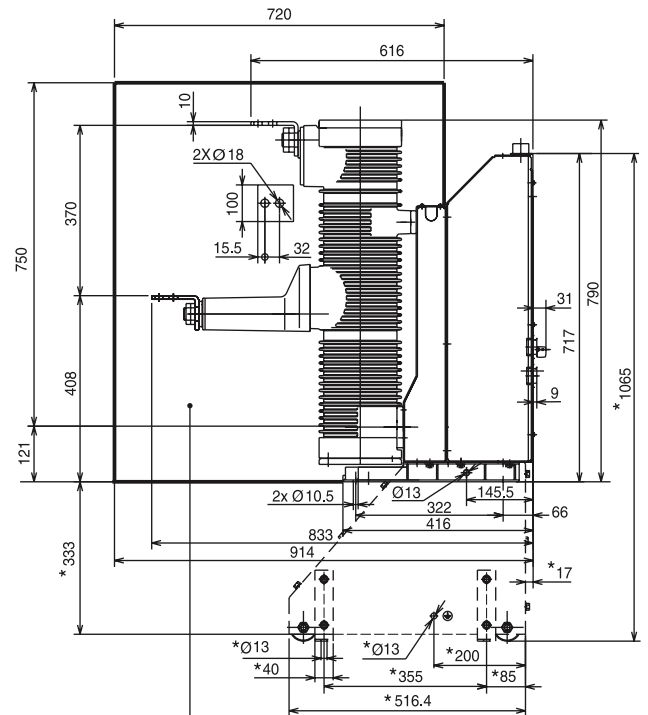
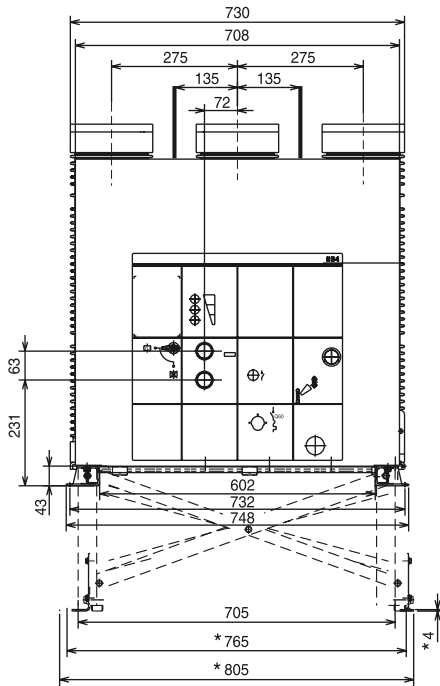
HD4	
with truck	
(on request)	
TN	7268
Ir	2000 A
	20 kA
Isc	25 kA
	31.5 kA



Insulating partitions to be provided by the customer
(a special kit is available on request).
* Distance with truck (if provided).

Fixed circuit breakers

HD4	
with truck	
(on request)	
TN	7315
Ur	36 kV
	2500 A
	20 kA
Isc	25 kA
	31.5 kA

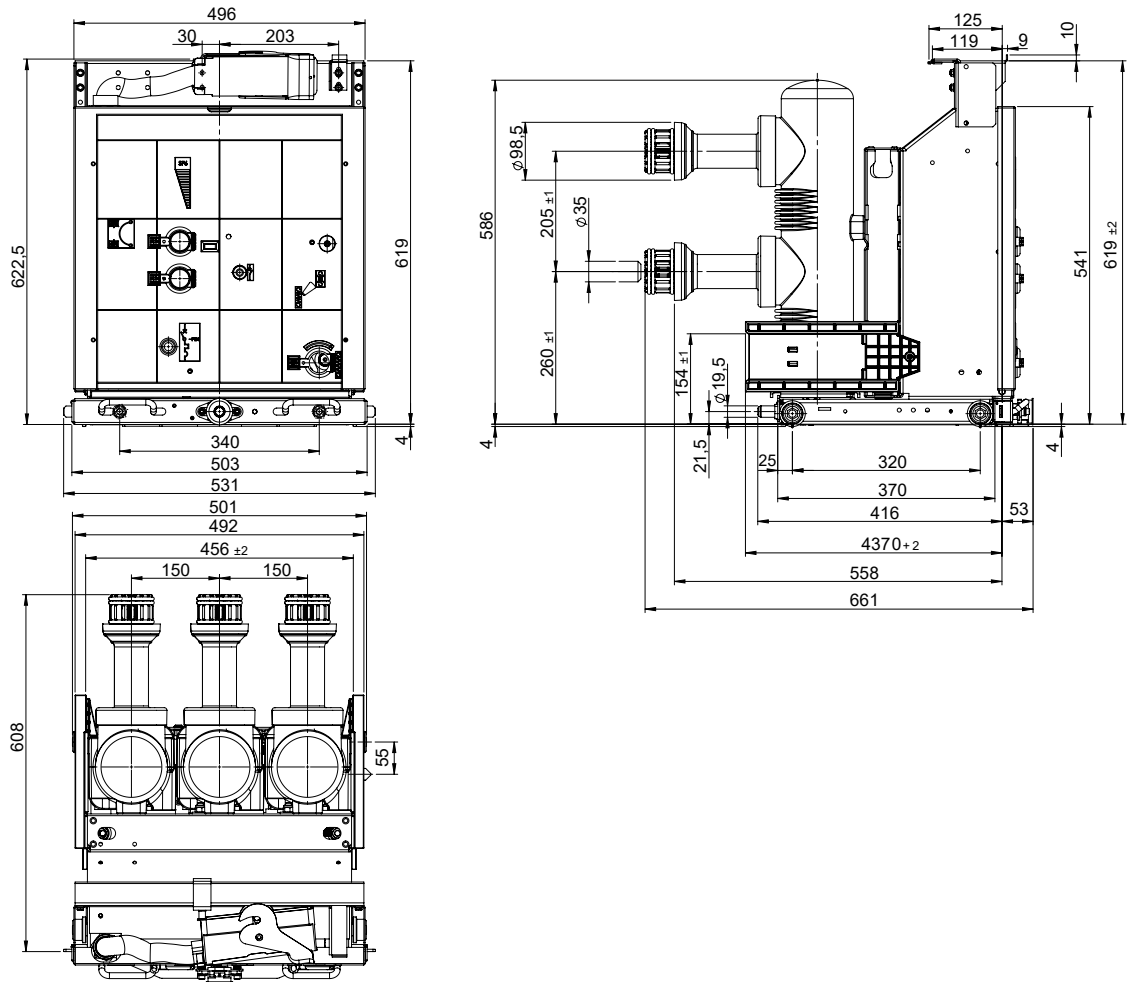


Insulating partitions to be provided by the customer
(a special kit is available on request).
* Distance with truck (if provided).

HD4/P withdrawable circuit breakers for UniGear type ZS1 switchgears

HD4/P		
TN	1VCD000227	
Ur	12	kV
	17.5	A
Ir	630	A
	1250	A
Isc	16	kA
	25	kA
	31.5	kA

Also suitable for PowerCube PB1



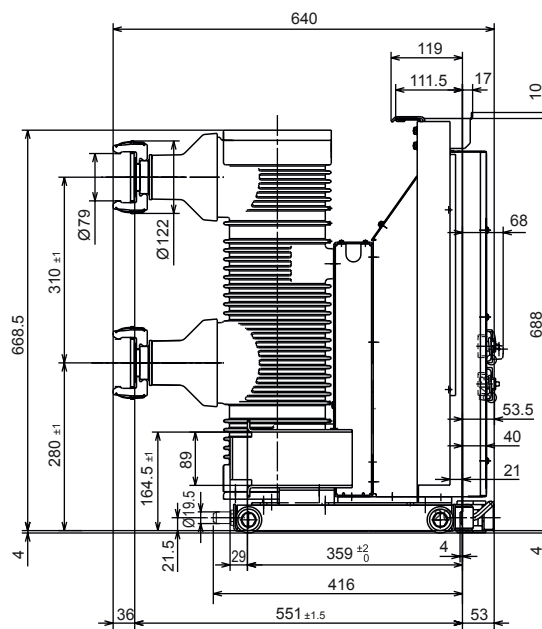
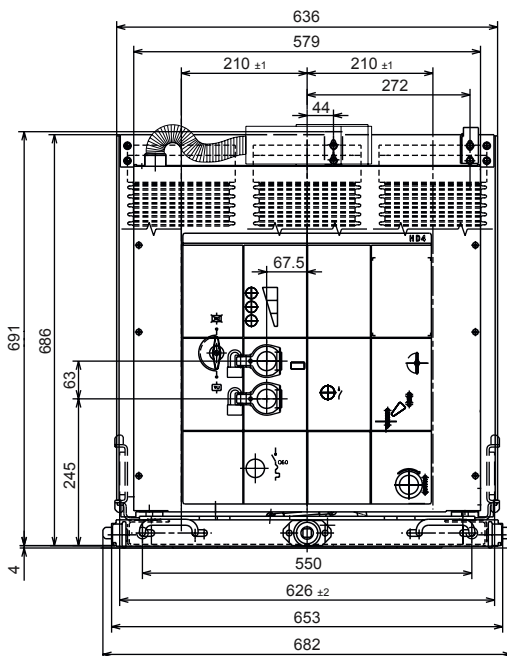
Overall dimensions

HD4/P withdrawable circuit breakers for UniGear type ZS1 switchgears

HD4/P		
TN	7350	
Ur	12	kV
	17.5	kV
Ir	1250	A
Isc	40	kA

HD4/P		
TN	7350	
Ur	12	kV
	17.5	kV
Ir	1600	A
	25	kA
	31.5	kA
Isc	40	kA (*)
	50	kA (*)

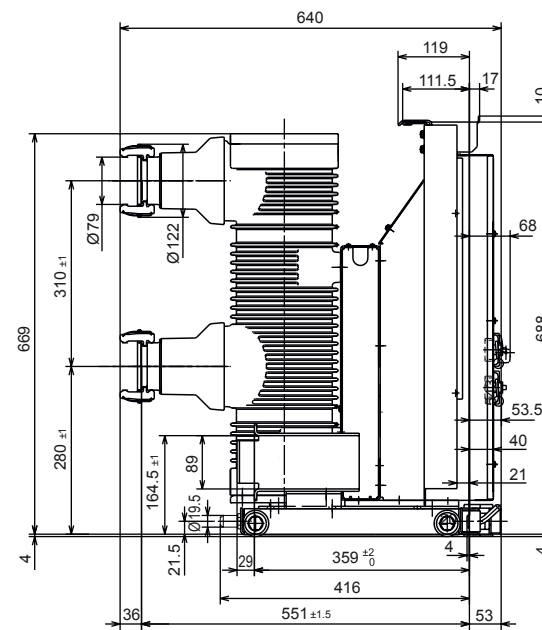
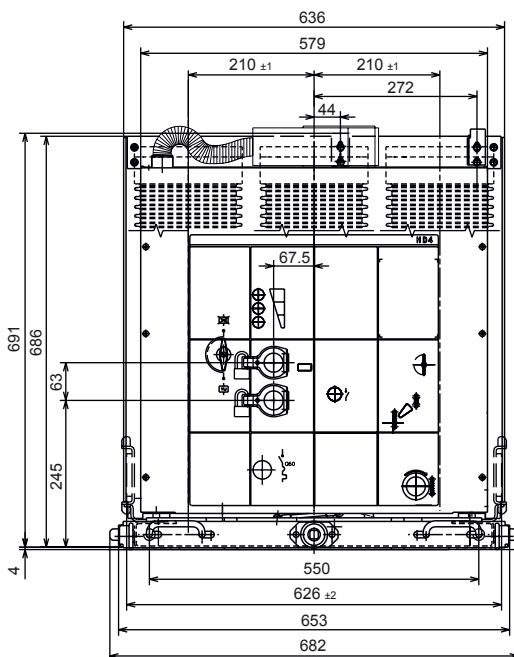
(*) Also suitable for PowerCube PB2.



HD4/P withdrawable circuit breakers for UniGear type ZS1 switchgears

HD4/P		
TN	7351	
Ur	12	kV
	17.5	kV
Ir	2000	A
	25	kA
	31.5	kA
Isc	40	kA (*)
	50	kA (*)

(*) Also suitable for PowerCube PB2.

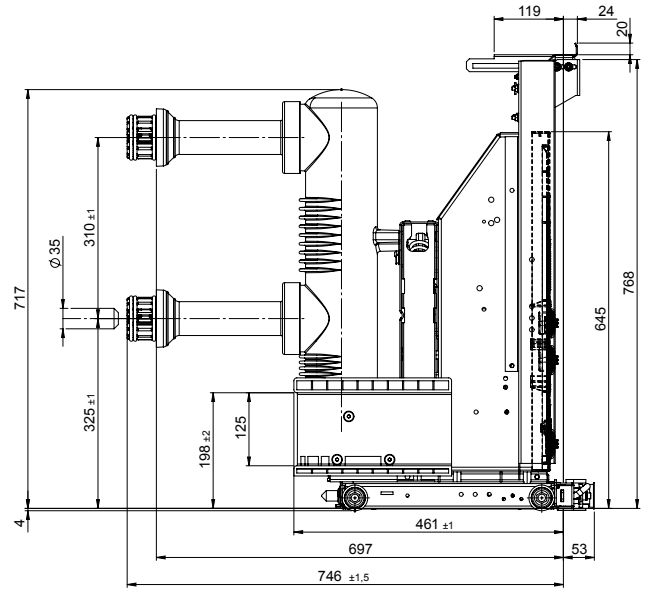
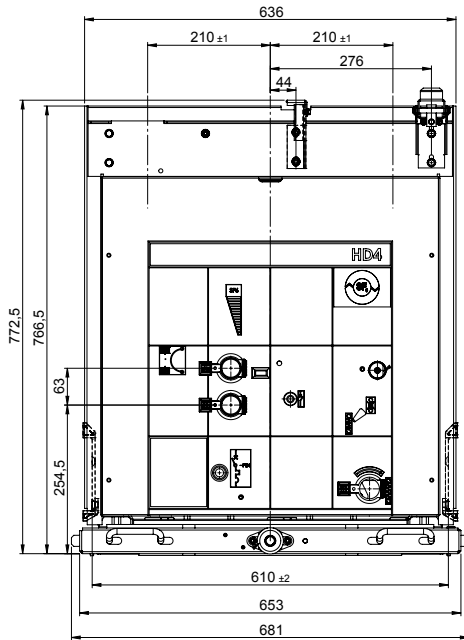


Overall dimensions

HD4/P withdrawable circuit breakers for UniGear type ZS1 switchgears

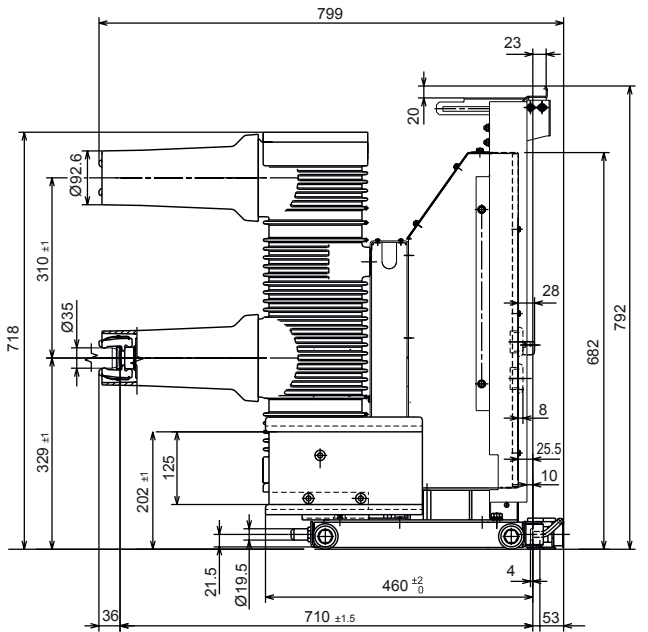
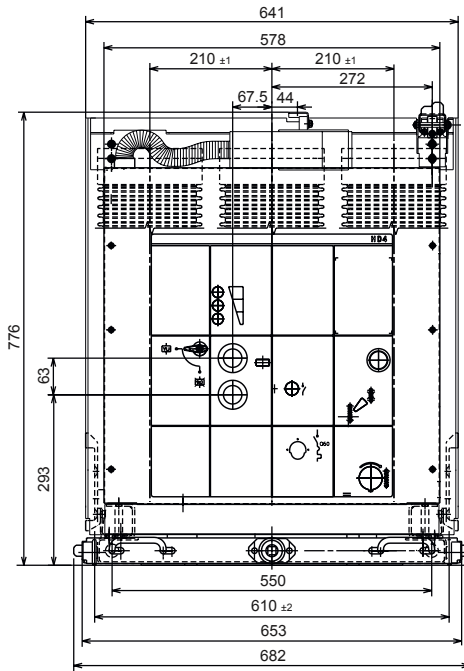
HD4/P		
TN	1VCD00236	
Ur	24	kV
Ir	630	A
	1250	A
Isc	16	kA(*)
	20	kA
	25	kA

(*) 630 A only.



HD4/P withdrawable circuit breakers for UniGear type ZS1 switchgears

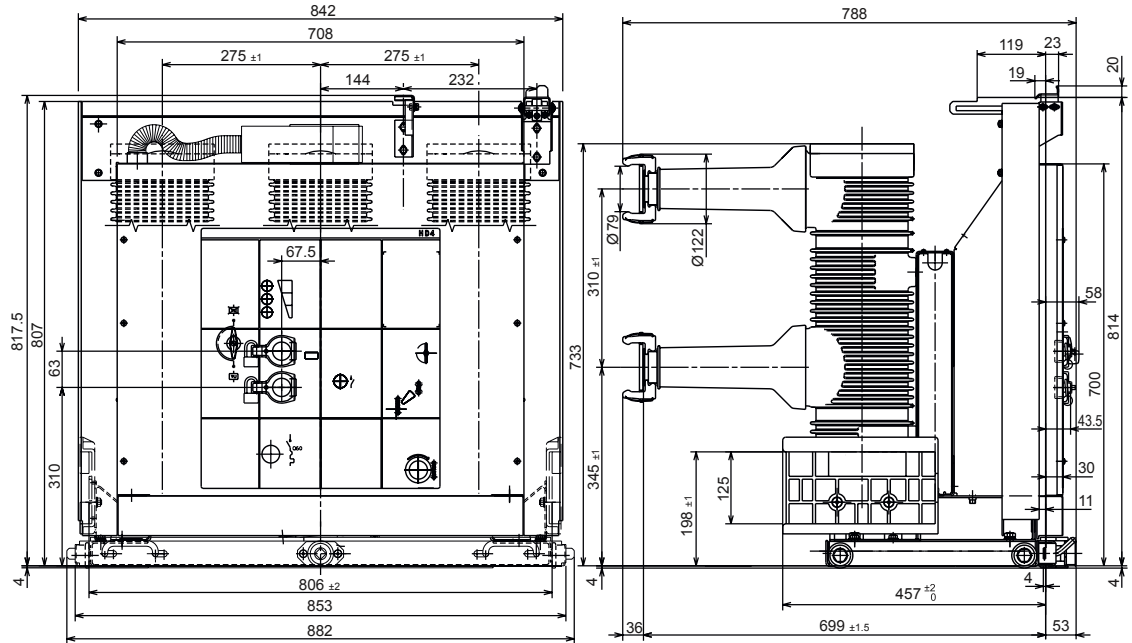
HD4/P		
TN	1VCD000099	
Ur	24	kV
Ir	1250	A
Isc	31.5	kA



HD4/P withdrawable circuit breakers for UniGear type ZS1 switchgears

HD4/P	
TN	7355 (*)
Ur	24 kV
Ir	1600 A
Isc	16 kA
	20 kA
	25 kA
	31.5 kA

(*) Also suitable for PowerCube PB5.

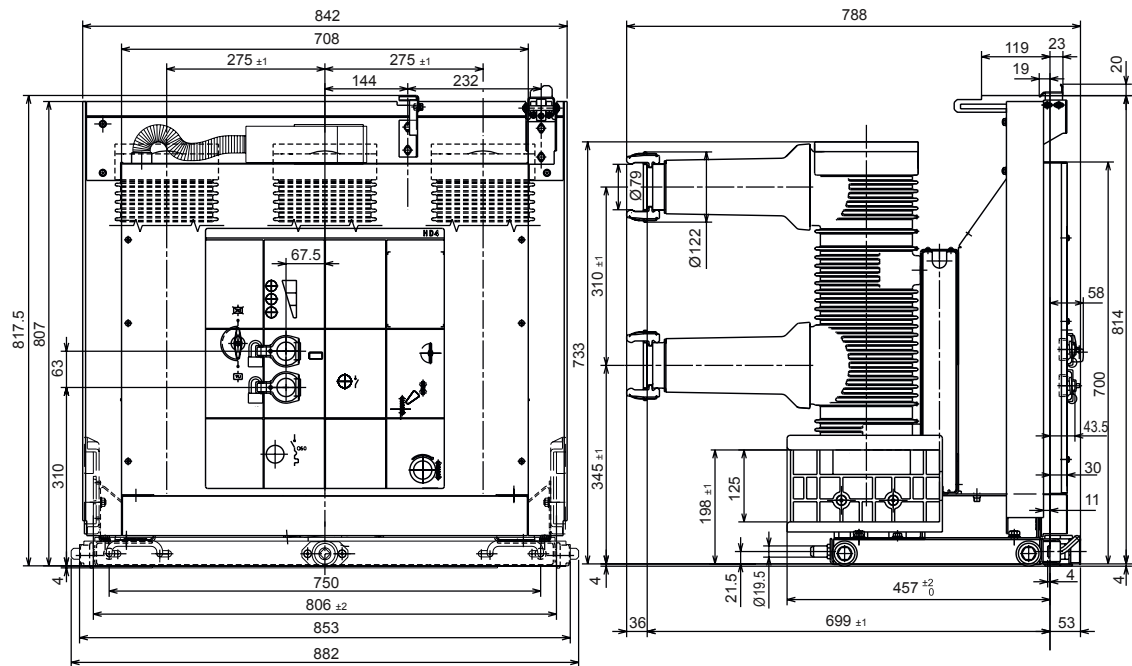


HD4/P withdrawable circuit breakers for UniGear type ZS1 switchgears

HD4/P	
TN	7356 (**)
Ur	24 kV
Ir	2000 A
Isc	16 kA
	20 kA
	25 kA
	31.5 kA

HD4/P	
TN	7356 (**)
Ur	24 kV
Ir	2500 A (*)
Isc	20 kA
	25 kA
	31.5 kA

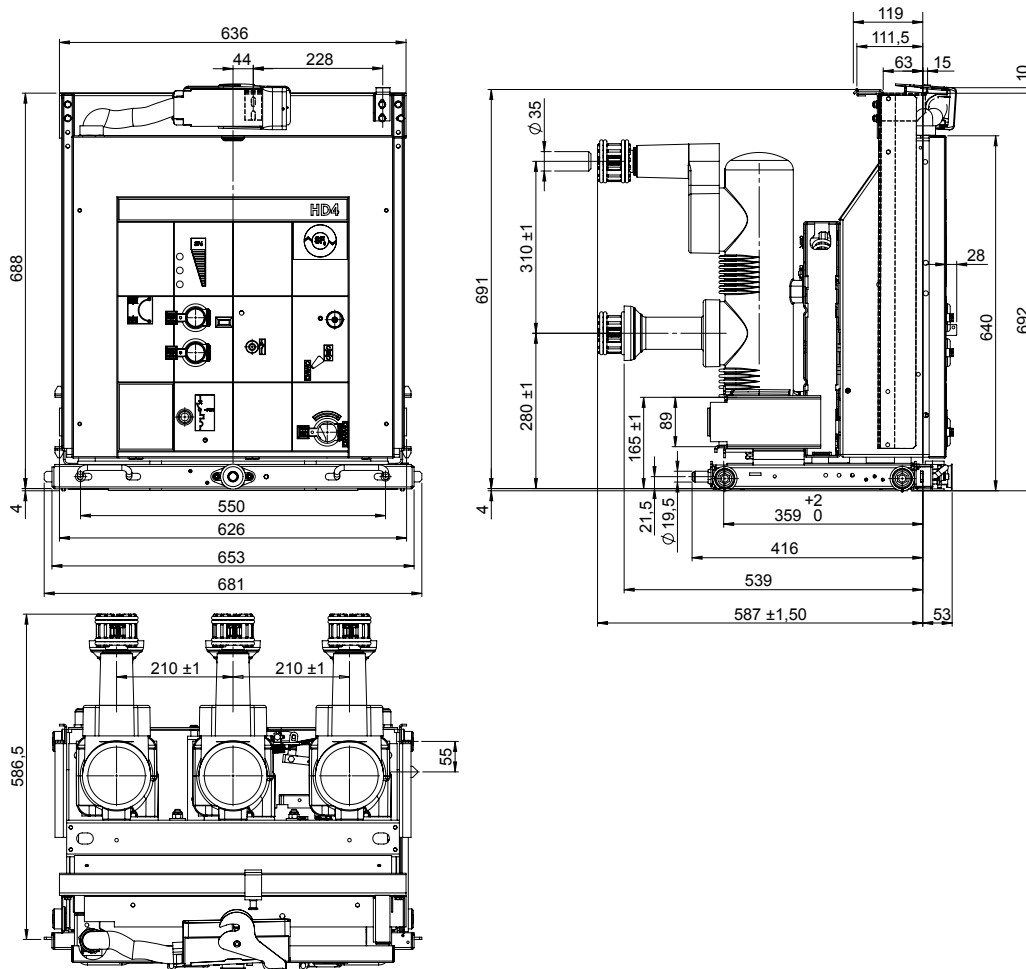
(*) 2500 A with forced ventilation; 2300 A with natural ventilation.
 (**) Also suitable for PowerCube PB5.



Overall dimensions

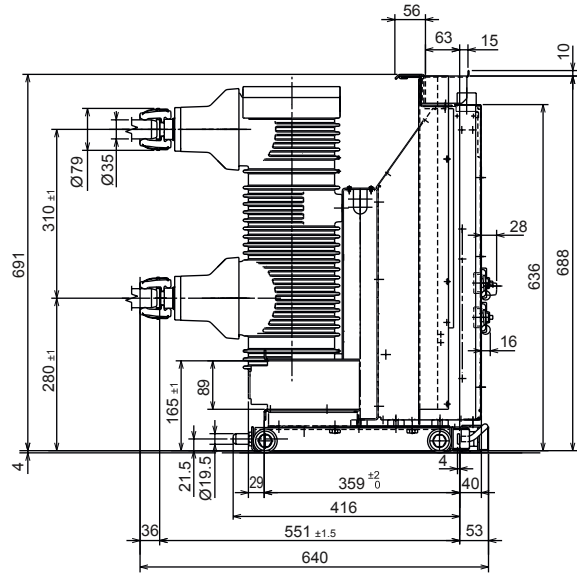
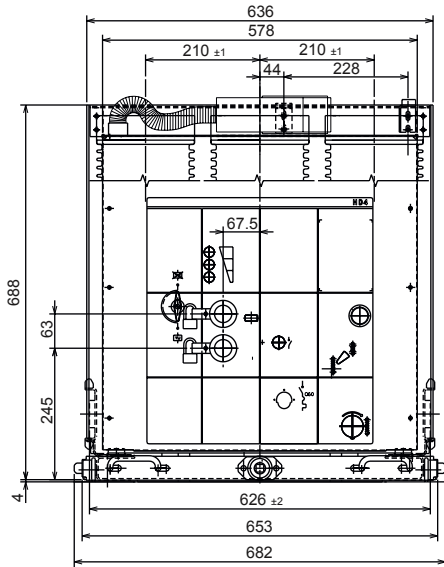
HD4/W withdrawable circuit breakers for PowerCube modules

HD4/W	
TN	1VCD000228
Ur	12 kV
	17.5 kV
Ir	630 A
	1250 A
Isc	16 kA
	25 kA
	31.5 kA



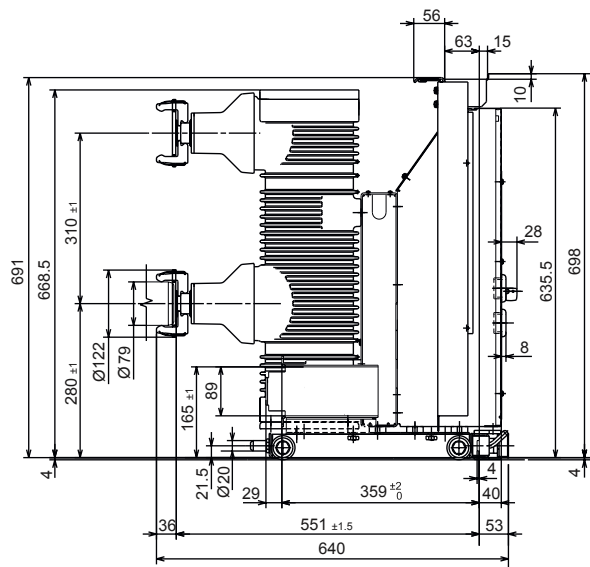
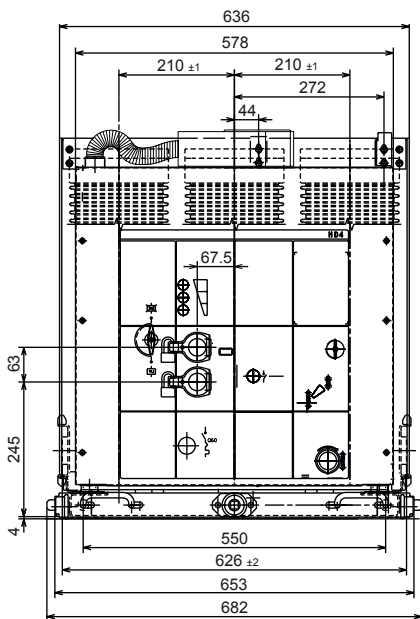
HD4/W withdrawable circuit breakers for PowerCube modules

HD4/W		
TN	7421	
Ur	12	kV
	17.5	kV
Ir	1250 A	
Isc	40	kA
	50	kA



HD4/W withdrawable circuit breakers for PowerCube modules

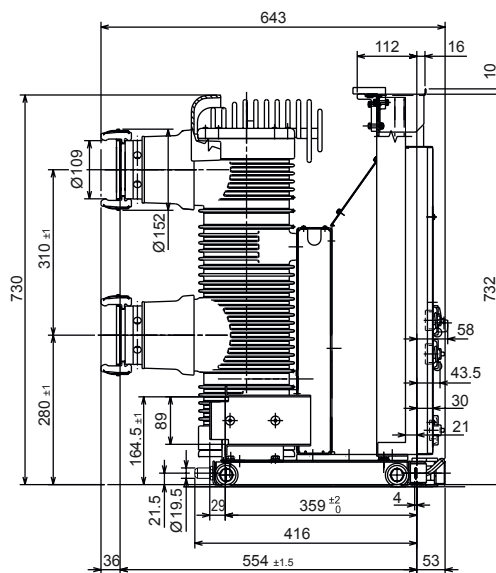
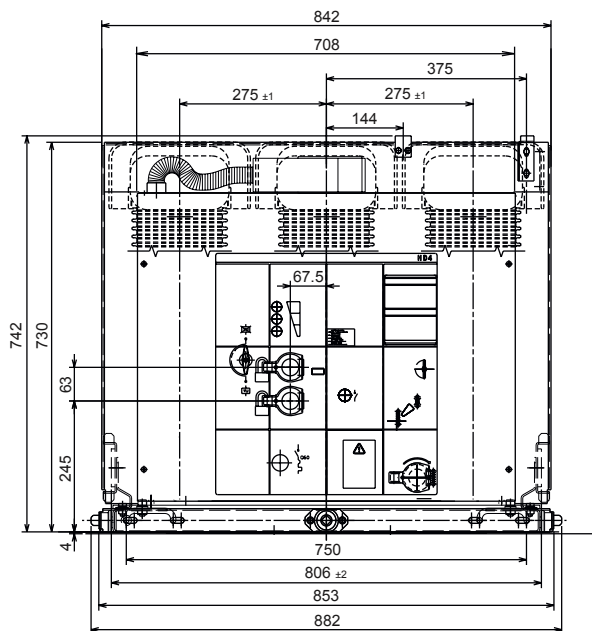
HD4/W		
TN	7239	
Ur	12	kV
	17.5	kV
Ir	1600	A
	2000	A
Isc	16	kA
	25	kA
	31.5	kA



Overall dimensions

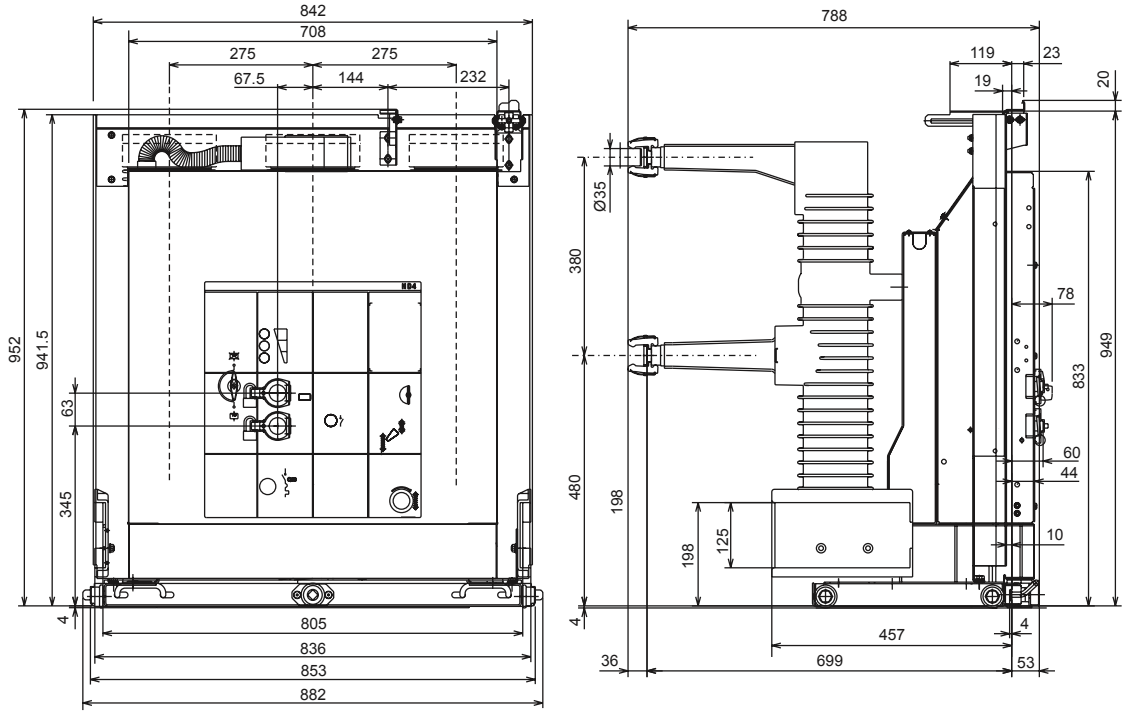
HD4/W withdrawable circuit breakers for PowerCube modules

HD4/W	
TN	1VCD000053
Ur	12 kV
	17.5 kV
Ir	3150 A
	31.5 kA
Isc	40 kA
	50 kA



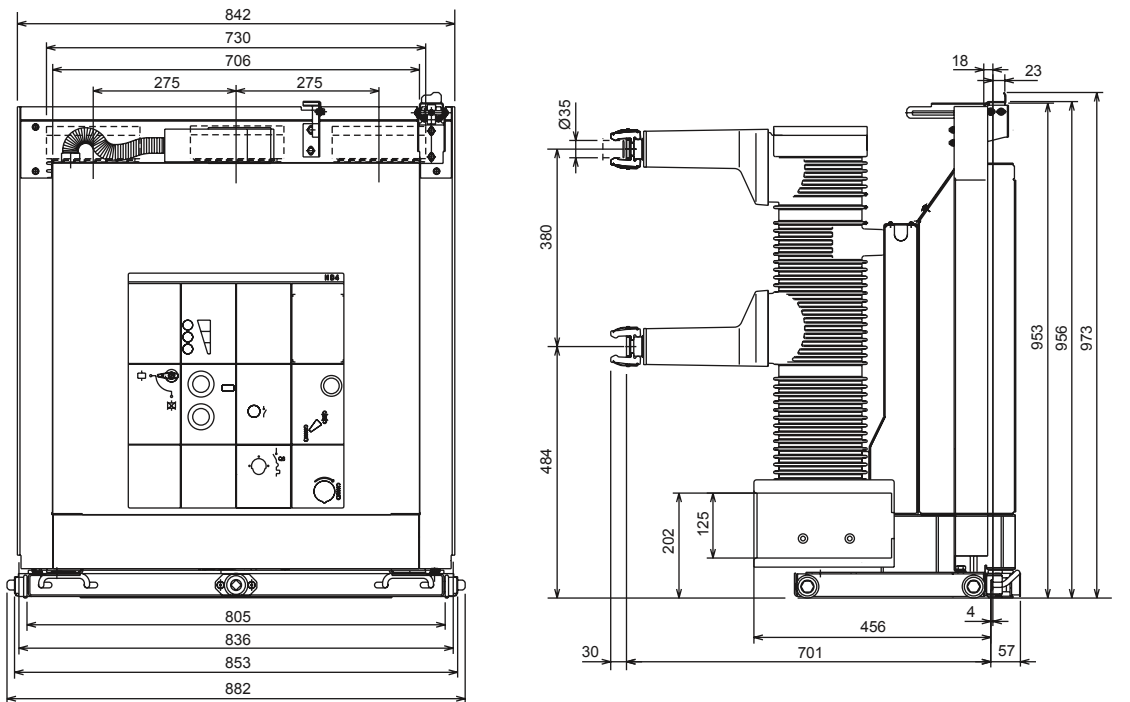
Withdrawable circuit breakers HD4/W for UniGear type ZS2 switchgear and for PowerCube module

HD4/W		
TN	7402	
Ur	36	kV
Ir	1250	A
Isc	20	kA
	25	kA



Withdrawable circuit breakers HD4/W for UniGear type ZS2 switchgear and for PowerCube module

HD4/W		
TN	7316	
Ur	36	kV
Ir	1250	A
Isc	31.5	kA

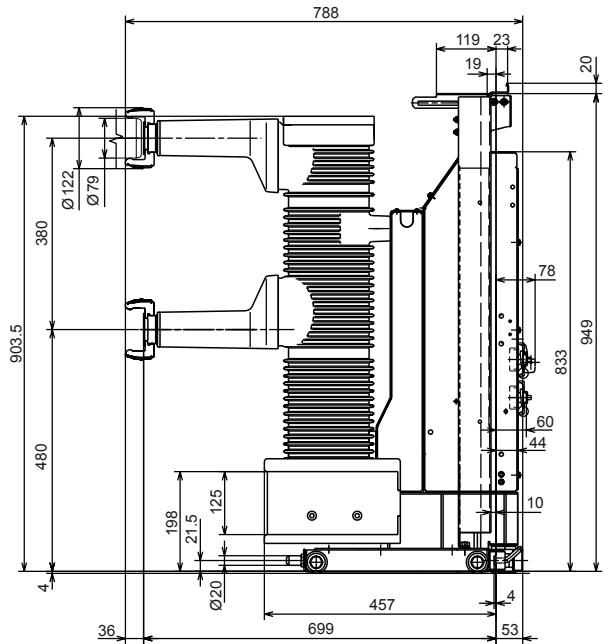
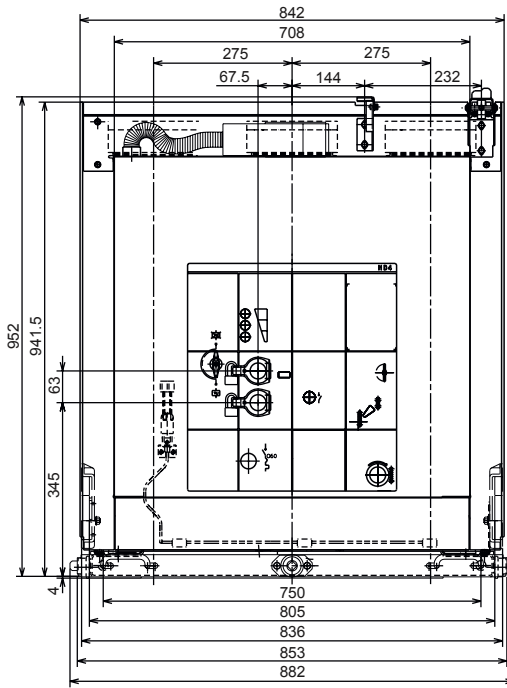


Overall dimensions

Withdrawable circuit breakers HD4/W for UniGear type ZS2 switchgear and for PowerCube module

HD4/W		
TN	7317	
Ur	36	kV
	1600	A
Ir	2000	A
	2500	A (*)
	20	kA
Isc	25	kA
	31.5	kA

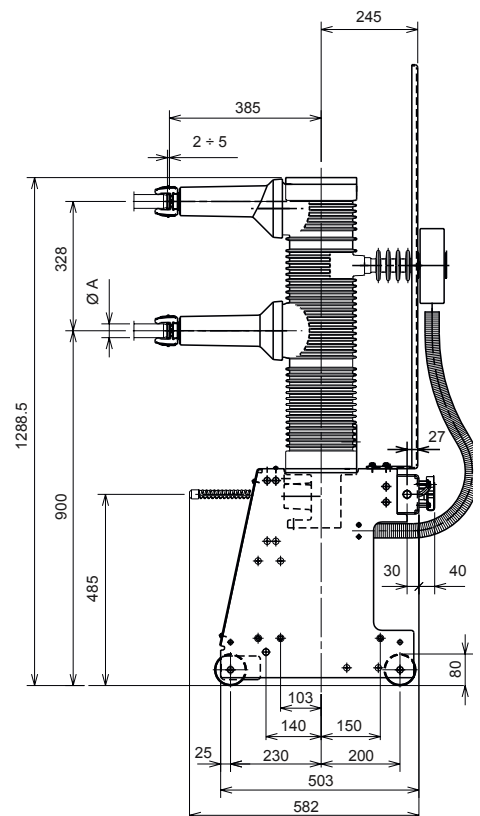
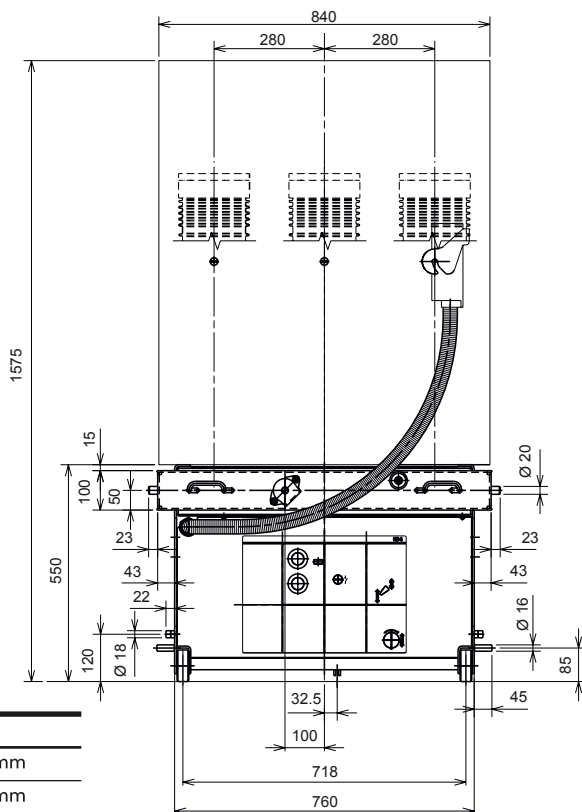
(*) With forced ventilation.



HD4/Z withdrawable circuit breakers for UniGear type ZS3.2 - 40.5 kV switchgears

HD4/Z/40,5 kV		
TN	7227	
Ur	40.5	kV
	1250	A
	1600	A
Ir	2000	A
	2500	A (*)
	25	kA
Isc	31.5	kA

(*) With natural ventilation in loose enclosure type Powerbloc; with forced ventilation in switchgear type



	Ø A
1250-1600 A	35 mm
2000-2500 A (*)	79 mm

