

## DRIESCHER - Indoor Vacuum Circuit-Breaker

- Rated voltage  
12 kV to 38.5 kV
- Rated current  
630 A to 2500 A



# V625

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## DRIESCHER - Indoor Vacuum Circuit-Breaker

- 2 General, operating conditions
- 3 Technical data
- 4 Table of vacuum circuit-breakers 12 kV and 24 kV up to 1250 A
- 5 Table of vacuum circuit-breakers 12 kV and 24 kV from 1600 A
- 5 Table of vacuum circuit-breakers 36 kV and 38.5 kV
- 6 Design and principle of operation of the circuit-breaker
- 7 Schematic diagram of the design
- 8 Schematic diagram of release mechanisms, maintenance



### General

The new DRIESCHER vacuum circuit-breaker is a technological further development of the well-proven vacuum circuit-breaker series 745.

These three-pole indoor circuit-breakers are designed for rated voltages of 12 kV to 38.5 kV and rated

currents of 630 A to 2500 A.

All specified circuit-breakers are delivered for front panel installation. For wall-mounted circuit-breakers please refer to prospect 745.

### Operating conditions

The breakers are designed for normal operating conditions in compliance with IEC 60694 (DIN VDE 0670 Part 1000), class "minus 5 indoors". A reliable operation is still guaranteed at minus temperatures of  $-15^{\circ}$ . The maximum ambient temperature is  $40^{\circ}\text{C}$ ; the mean value over 24 hours is max.  $35^{\circ}\text{C}$ .

The values on insulation strength are – corresponding to VDE 0670 Part 1000 – related to sea level. For installations at altitudes of up to 1000 m any reduction

in insulation caused by the reduced insulating property of the air is insignificant and can be ignored. For installation at altitudes  $> 1000$  m it is necessary to correct the values given for the rated power-frequency withstand voltage and the rated lightning impulse withstand voltage (e.g. the insulating property of the clearance at an altitude of 2000 m above sea level is reduced by the factor 0.81).

## DRIESCHER - Indoor Vacuum Circuit-Breakers

The type testing was carried out by independent, accredited testing institutes (FGH Mannheim and IPH Berlin). The circuit-breakers are in compliance with the DIN VDE 0670 Part 101-104 and IEC Publication 60056.

### Technical data

Rated voltage	Rated power frequency withstand voltage	Rated impulse withstand voltage	Rated frequency	Transient recovery voltage	Rate of rise of TRV	Closing time approx.	Arcing time	Opening time approx.	Rated short circuit breaking current	Rated short circuit making current	Rated short-time current	Rated short-circuit duration	Rated peak withstand current	Rated current A						
														kV	kV	kV	Hz	kV	kV/μs	ms
12	28	75	50	21	0.34	65	<17	65	25	62.5	25	2	62.5	●						
									25	62.5	25	3	62.5		●					
									32	80	32	2	80	●						
									32	80	32	3	80		●	●	●	●		
24	50	125	50	41	0.47	65	<17	65	25	62.5	25	2	62.5	●						
									25	62.5	25	3	62.5		●	●	●			
36	70	170	50	66	0.57	65	<17	70	20	50	20	3	50	●						
									20	50	20	3	50		●					
38.5	80	180	50	70	0.57	65	<17	70	20	50	20	3	50	●						
									20	50	20	3	50		●					

Types:

V....BKF with coil spring stored energy mechanism, front-panel mounting

V....KUF with coil spring stored energy mechanism and suitable for automatic reclosing, front-panel mounting

Rated voltage	kV
Possible operating cycles	
- of the vacuum interrupter at rated current	30 000
- of the vacuum interrupter at rated short circuit breaking current	50
- of the breaker mechanism	10 000
max. contact erosion	mm
	2

V..32 BKF

V..25 KUF

V..25 KUF

V..20 KUF

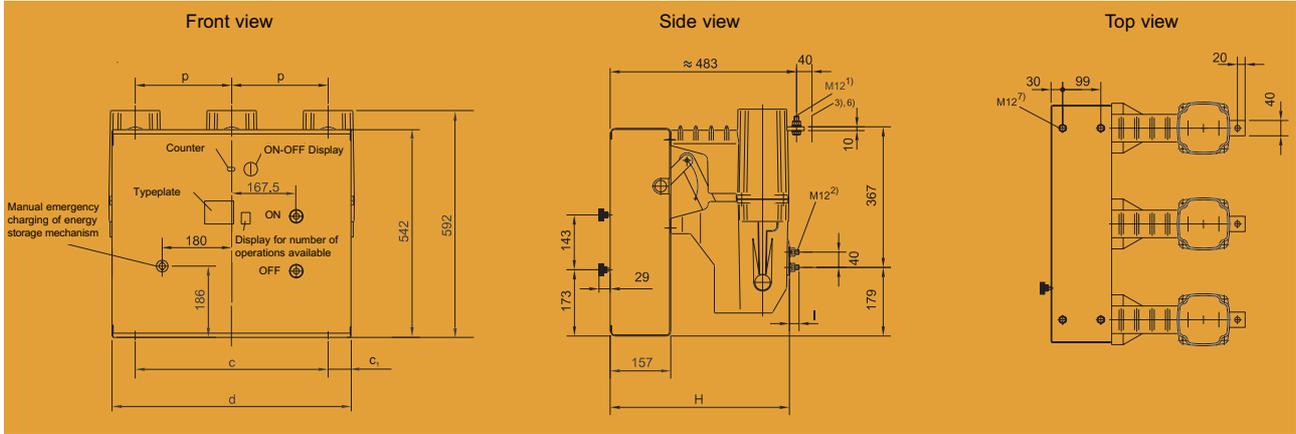
V..20 KUF

Rated voltage	12	24	36	38.5
Possible operating cycles				
- of the vacuum interrupter at rated current	30 000	30 000	15 000	15 000
- of the vacuum interrupter at rated short circuit breaking current	50	50	50	50
- of the breaker mechanism	10 000	10 000	10 000	10 000
max. contact erosion	mm	2	2	2

Rated switching action sequence

0 - 0.3s - CO - 3 min - CO for motorized actuator  
0 - 3 min - CO for manual actuator

Vacuum Circuit-Breaker Table 12 kV and 24 kV up to 1250 A



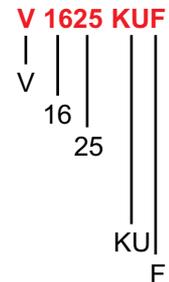
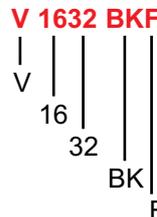
Type	Rated voltage	Rated current	Rated short circuit breaking current	Pole distance p (mm)	c	c <sub>1</sub>	d	H	I	Part no. <sup>4)</sup>	Drawing no.
V 625 KUF	12 kV	630 A	25 kA	155 <sup>6)</sup>	420	23	460	464.5	25	746 0400x	LS3-094237
V 1225 KUF	12 kV	1250 A	25 kA	155 <sup>6)</sup>	420	23	460	470.5	29	746 0401x	LS3-096849
V 625 KUF	12 kV	630 A	25 kA	210	510	23	550	464.5	25	746 1410x	LS3-096848
V 1225 KUF	12 kV	1250 A	25 kA	210	510	23	550	470.5	29	746 1411x	LS3-096850
V 632 BKF	12 kV	630 A	32 kA	210	510	23	550	464.5	25	746 1710x	LS3-098802
V 1232 BKF	12 kV	1250 A	32 kA	210	510	23	550	470.5	29	746 1711x	LS3-098803
V 625 KUF	24 kV	630 A	25 kA	225	540	23	580	464.5	25	746 3430x	LS3-096851
V 825 KUF	24 kV	800 A	25 kA	225	540	23	580	464.5	25	746 3434x	LS3-096854
V 1225 KUF	24 kV	1250 A	25 kA	225	540	23	580	470.5	29	746 3431x	LS3-096856
V 625 KUF	24 kV	630 A	25 kA	275	640	20	680	470.5	25	746 5430x	LS3-096853
V 1225 KUF	24 kV	1250 A	25 kA	275	640	20	680	470.5	29	746 5431x	LS3-096858
V 625 KUF	24 kV	630 A	25 kA	250	500	20	620	464.5	25	746 4410x	LS3-096852
V 1225 KUF	24 kV	1250 A	25 kA	250	500	20	620	470.5	29	746 4411x	LS3-096857

- 1) hexagon bolt M12x40 (from 1600 A; M12x50) with nut, washer and lock washer
- 2) threaded pin (fixed) with nut, washer and lock washer
- 3) as from 1250 A two connecting bolts
- 4) the last digit of the part numbers indicates the respective motor voltage:  
 746 xxxx1 = 230 V AC  
 746 xxxx2 = 110 V AC  
 746 xxxx3 = 220 V DC  
 746 xxxx4 = 110 V DC  
 746 xxxx5 = 60 V DC  
 746 xxxx6 = 48 V DC  
 746 xxxx7 = 24 V DC
- 5) appropriate additional insulation is required
- 6) appropriate bar support is required
- 7) press-in nuts M12 at the top and bottom for mounting switchgear, refer also to c or c<sub>1</sub>
- 8) at phase spacing of p=275; 172.5 mm
- 9) at phase spacing of p=275; 160 mm

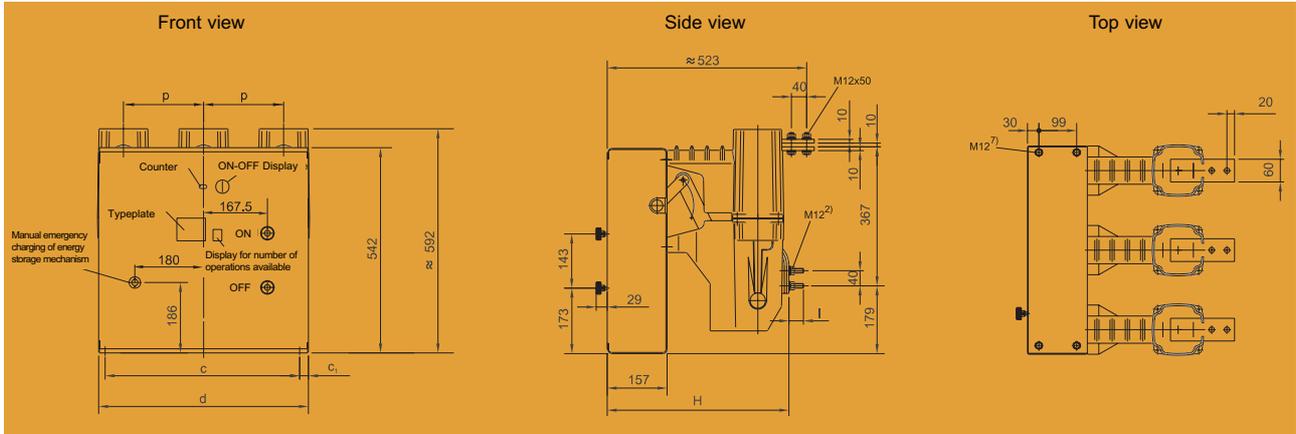
Type designation

Example:

Vacuum circuit breaker  
 Rated current (1600 A)  
 Rated short-circuit breaking current (kA)  
 - with coil-spring energy storage mechanism  
 Design for front-panel mounting (e.g. on switchgear truck)  
 - with coil-spring energy storage mechanism and suitable for auto-reclosing  
 Design for front-panel mounting (e.g. on switchgear truck)

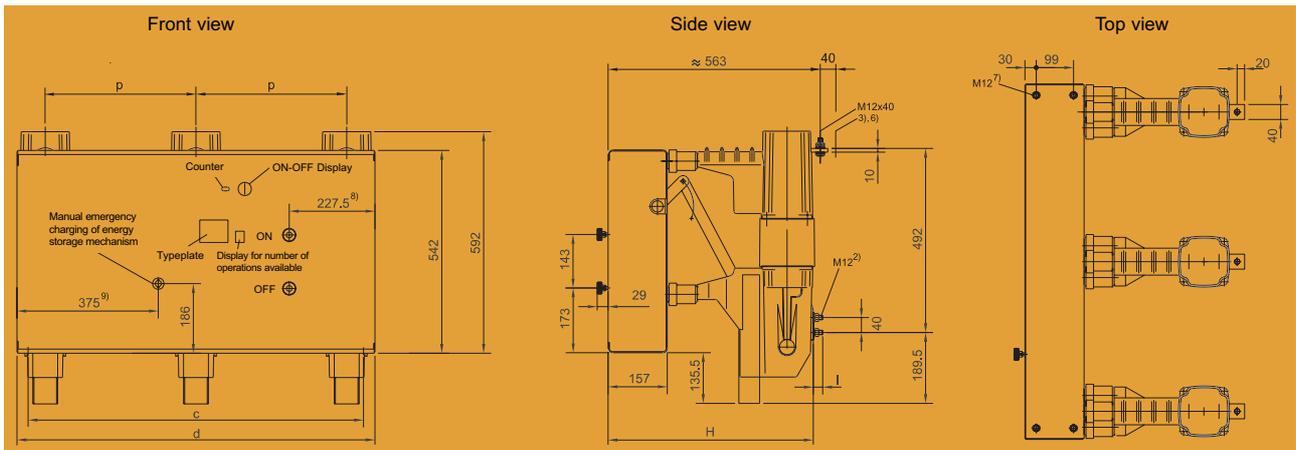


## Vacuum Circuit-Breaker Table 12 kV and 24 kV from 1600 A



Type	Rated voltage	Rated current	Rated short circuit breaking current	Pole distance p (mm)	c	c <sub>1</sub>	d	H	I	Part no. <sup>4)</sup>	Drawing-no.
V 1625 KUF	12 kV	1600 A	25 kA	210	510	23	550	476.5	38	746 1412x	LS3-098771
V 2025 KUF	12 kV	2000 A	25 kA	210	510	23	550	476.5	38	746 1413x	LS3-098772
V 2525 KUF	12 kV	2500 A	25 kA	210	510	23	550	482.5	38	746 1414x	LS3-098773
V 1632 BKF	12 kV	1600 A	32 kA	210	510	23	550	476.5	38	746 1712x	LS3-098804
V 2032 BKF	12 kV	2000 A	32 kA	210	510	23	550	476.5	38	746 1713x	LS3-098805
V 2532 BKF	12 kV	2500 A	32 kA	210	510	23	550	482.5	38	746 1714x	LS3-098806
V 1625 KUF	24 kV	1600 A	25 kA	225	540	23	580	476.5	38	746 3432x	LS3-098807
V 2025 KUF	24 kV	2000 A	25 kA	225	540	23	580	476.5	38	746 3433x	LS3-098810
V 1625 KUF	24 kV	1600 A	25 kA	275	640	20	680	476.5	38	746 5432x	LS3-098809
V 2025 KUF	24 kV	2000 A	25 kA	275	640	20	680	476.5	38	746 5433x	LS3-098812
V 1625 KUF	24 kV	1600 A	25 kA	250	500	20	620	476.5	38	746 4412x	LS3-098808
V 2025 KUF	24 kV	2000 A	25 kA	250	500	20	620	476.5	38	746 4413x	LS3-098811

## Vacuum Circuit-Breaker Table 36 kV and 38.5 kV



Type	Rated voltage	Rated current	Rated short circuit breaking current	Pole distance p (mm)	c	d	H	I	Part no. <sup>4)</sup>	Drawing-no.
V 620 KUF	36 kV	630 A	20 kA	275 <sup>5)</sup>	640	680	544.5	25	746 6444x	LS3-096859
V 1220 KUF	36 kV	1250 A	20 kA	275 <sup>5)</sup>	640	680	550.5	29	746 6443x	LS3-096860
V 620 KUF	36 kV	630 A	20 kA	400	890	950	544.5	25	746 7474x	LS3-096861
V 1220 KUF	36 kV	1250 A	20 kA	400	890	950	550.5	29	746 7473x	LS3-096862
V 620 KUF	38.5 kV	630 A	20 kA	275 <sup>5)</sup>	640	680	544.5	25	746 6440x	LS3-096863
V 1220 KUF	38.5 kV	1250 A	20 kA	275 <sup>5)</sup>	640	680	550.5	29	746 6441x	LS3-096864
V 620 KUF	38.5 kV	630 A	20 kA	400	890	950	544.5	25	746 7470x	LS3-096865
V 1220 KUF	38.5 kV	1250 A	20 kA	400	890	950	550.6	29	746 7471x	LS3-096866

The new DRIESCHER vacuum circuit-breaker is a technical further development of our well-proven vacuum circuit-breaker series 745.

This vacuum circuit-breaker is made up of the following five (refer also to page 7) sub-assemblies which are coordinated with maximum precision:

Via **operating mechanism** ① the coil-spring energy storage mechanism is manually or electrically charged. Should the supply voltage fail, the coil-spring energy storage mechanism can be charged via the operating shaft using a crank.

*Feature:*

- *an overload coupling now prevents any overloading of the energy storage mechanism.*

**The coil-spring energy storage mechanism** ② comprises three coil springs and an end position damping. This stores the energy (display), precisely controls the energy transmission and permits constant operating speeds.

*Feature:*

- *The energy is stored for 3 switching operations*
- *The adjusted end position damping permits an optimal switching operation. The mechanism is therefore extremely low in wear, low in maintenance, and has a long service life.*

Via **the switching module** ③ it is possible to operate the circuit-breaker manually by pressing the push-buttons or it can be operated electrically (release mechanism). The motor of the operating mechanism immediately recharges the coil-spring energy storage mechanism after operation. In addition to the release mechanisms the switching module also includes the locking mechanisms.

*Feature:*

- *The last possible switching operation is always and OFF switching operation*
- *For further electrical operations a second OFF release can be installed*
- *Short switching cycles*

**The electrical components** ④ with their displays (operations counter, switch position) operate the circuit-breaker depending on the respective circuit layout (e.g. auto reclosing). The 50-pin plug connector is positioned on the top of the breaker frame.

For withdrawable techniques it is only necessary to attach an easy-to-install coupler connector.

*Feature:*

- *fast electrical conversion is possible (e.g. KU auto reclosing)*

**The operating shaft** ⑤ assembled in the breaker frame transmits the operating energy via insulating bars (8) to the vacuum interrupters.

*Advantage of the breaker frame:*

- *compact design possible*
- *very lightweight and stable*

**The high quality vacuum interrupters** are housed in moulded parts of Duroplast insulating material (9). The **current** in the breaker pole flows from the upper terminal (1) to the fixed contact (2) of the vacuum interrupter.

The laminated contact ribbon (4) is screwed to the moving contact (3) of the vacuum interrupter. The spring (5) provides the required contact pressure and compensates the permissible contact burn (M) during the entire service life. The burn of the contacts in the vacuum interrupter can be monitored using the "M" mark. This can be carried out without necessitating dismantling. The pressure welded end of the contact ribbon forms the lower pole contact surface (7) which is supported by the contact arm (6).

*Advantage:*

- *small spacing between phases without additional insulation (phase separation plates)*
- *the vacuum interrupters are protected against extreme ambient conditions and damage*
- *the entire pole can be removed as one piece*

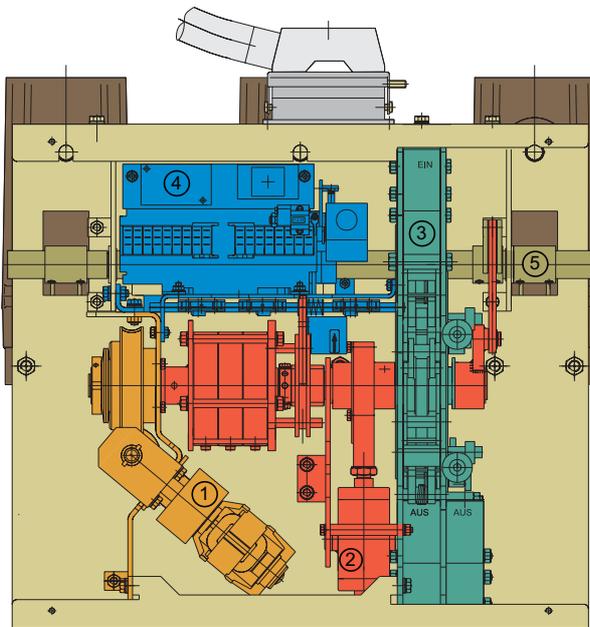
**Summary:**

**The sub-assemblies and their optimal arrangement have made it possible to provide an extremely compact design.**

**This circuit-breaker is therefore extremely flexible in its application and meets all customer requirements to the full.**

**This new, optimised mechanical design also permits a minimum amount of maintenance and guarantees an extremely long service life.**

## Schematic diagram of assembly design and operating principle

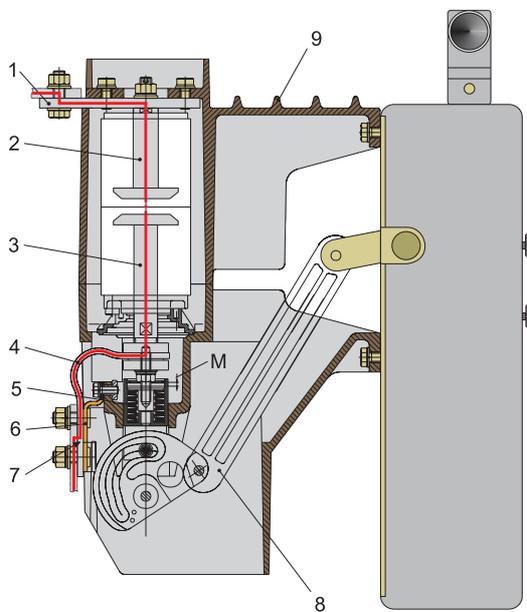


### Basic equipment:

- Push-button for On and Off switching on site
- Display of breaker position ON/OFF
- Display of charging condition of coil-spring energy storage mechanism
- Operations counter

### Possible equipment:

- Electric motor
- Pump suppresser
- Auxiliary switch for motor, controls and locking mechanisms
- Additional releases (refer to Page 8)



- Very high mechanical service life through optimised power transmission of precision-coordinated subassemblies with end position damping
- Flexible application through compact design
- Shorter delivery times
- Fast retrofitting possible (e.g. motor operating mechanism, auto reclosing)
- Exceptionally high service life
- Minimum amount of maintenance
- Previous models can be replaced at any time

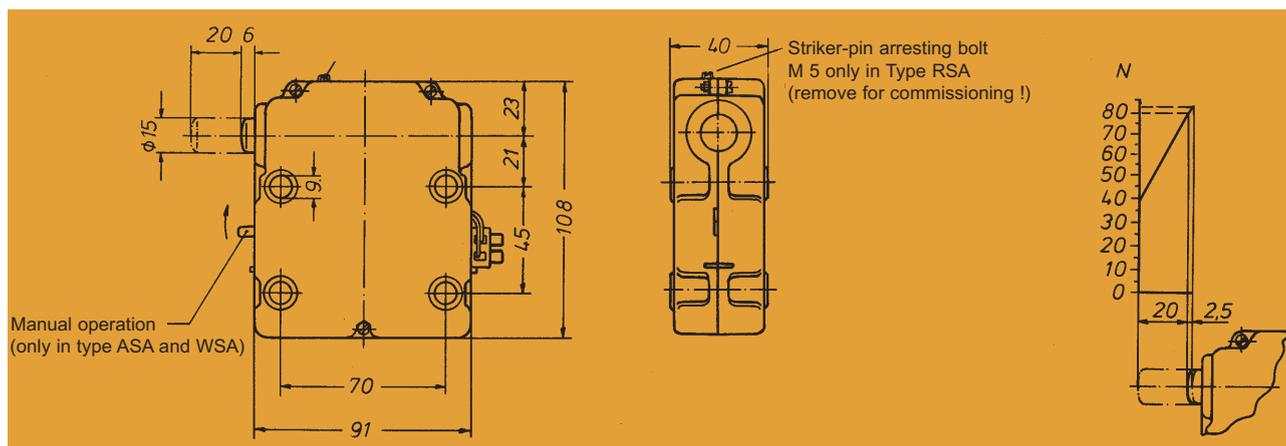
## Motor-operated mechanisms

Motors can optionally be delivered for AC or DC systems. The max. power input is approx. 200 W. The motors operate in short-time duty (S2).

The supply voltage is not to deviate from the rated supply voltage by more than  $-15\%$  to  $+10\%$ .

Motor voltage (V)	Current input (A)	Charging time (s)	Motor protection switch	
			..A	(A)
110 AC	2.8	8.2	2.5 - 4	2.5
230 AC	1.2	7.8	1 - 1.6	1
24 DC	12.2	9.3	10 - 16	11
48 DC	4.6	7.3	4 - 6.3	4.4
60 DC	4.9	5.7	4 - 6.3	4.6
110 DC	3.2	8.2	2.5 - 4	3
220 DC	1.3	8.8	1 - 1.6	1.1

## Schematic diagram of release mechanisms



Type	Rated current (A)	Rated voltage (V)	AC operation		DC operation		
			Consumption (VA)	Part no.	Rated voltage (V)	Consumption (W)	Part no.
<b>• Shunt release</b>							
ASA		-	-	-	12	56	772 04012
ASA		-	-	-	24	56	772 04024
ASA		-	-	-	48	88	772 04048
ASA		-	-	-	60	56	772 04060
ASA		100/110	105	772 03110	110	57	772 04110
ASA		230	110	772 03220	220	50	772 04220
<b>• Under-voltage release</b>							
RSA		-	-	-	24	10	772 05024
RSA		-	-	-	48	10	772 05048
RSA		100/110	19,5	772 05110	60	10	772 05060
RSA		-	-	-	110	10	772 05115
RSA		230	19,5	772 05220	220	10	772 05225
<b>• Indirect release</b>							
WSA	0,5	-	18	772 06005	-	-	-
WSA	1,0	-	18	772 06010	-	-	-
WSA	5,0	-	18	772 06050	-	-	-

## Maintenance

These new Driescher circuit-breakers boast extremely low-maintenance.

We recommend an annual visual inspection and occasional cleaning of the insulating parts. It is only necessary to lubricate the operating mechanism.

The manufacturers of the vacuum interrupters guarantee that the vacuum is maintained for at least 20 years, when handled correctly.

For more detailed specifications please refer to the operating and maintenance instructions B746.

Dimensions, weights, diagrams and descriptions in the list are non-binding. Subject to change without notice.

switching • electricity • safely

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