

# **DRIWISA™ HIGH VOLTAGE CURRENT-LIMITING FUSES HIGH INTERRUPTING CAPACITY INDOOR AND OUTDOOR USE**



**DRIWISA™** high voltage, current-limiting fuses are devices with a high interrupting capacity to protect high voltage systems against short-circuits.

They are selective elements for individual operation, with very well defined time-current characteristics, ideal for protection of transformers, motors, capacitors banks, cables, lines and other high voltage equipment installed in switchgear and distribution networks.

The accumulated experience for almost 30 years of DRIESCHER Y WITTJOHANN, S.A. in Mexico with the support of FRITZ DRIESCHER GmbH in Germany, has permitted the use of the electrical principles and phenomena involved during the fusing and arcing process, which are the basis to design and manufacture the fuses with a high dependability and quality level. The company has also characterized herself for the support and instructing capacity for its customers, making sure, that every technical problem the client has, is solved to a complete satisfaction.

**DRIWISA™** high voltage, current-limiting fuses are designed and manufactured according to international standards. This means, that the mechanical and dimensional features, such as the tube diameters and lengths and the force of the tripping pin of the fuses are according to these standards. The electrical features and specifications, such as the maximum interrupting current ( $I_1$ ), the critical interrupting current ( $I_2$ ), and the minimum interrupting current ( $I_3$ ) have been satisfactorily tested in internationally recognized laboratories.

**DRIWISA™** fuses are built within a service range from 2.4 to 38 kV. The DRS series is built for indoor use, while the DRS series (with "F" end-code) is used in outdoor applications, even for installation in tropical and very humid climates, for system frequencies from 40 to 60 Hz.

These fuses can be installed on special fuse-holders, non-load isolator switches and load-break disconnecting switches, thus giving an adequate protection against the dangerous thermic and dynamic stresses during a short-circuit (refer to the corresponding sections in the catalogue).

Fuses from the DRK series, having tapped end-caps, may be used for capacitor protection, being screwed directly onto the capacitor bushings.

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## **Current-limiting:**

When protecting equipment such as transformers, motors, capacitors, cables or lines with **DRIWISA™** fuses the currents flowing in case of a short-circuit are considerably reduced, due to the current-limiting characteristic of the fuses (refer to Figure 5 in the Fuse Manual).

## **Fuses not sensitive to transformer or motor inrush currents:**

Due to their relatively slow time-current characteristic, **DRIWISA™** fuses installed to protect transformers or motors do not exhibit premature fusion or degradation of the fuse-elements if selected according to the recommendations given in Technical Bulletins 201 and 202.

## **Permanently fixed fuse-elements:**

The fuse-elements are wound on special element-holders with dented borders to ensure they are held in place permanently, thus avoiding dislocation and preventing internal short-circuits, which would provoke a degradation of the fuses characteristics.

## **Tripping device with excellent operation characteristics:**

**DRIWISA™** fuses are equipped with a tripping device (striker pin) acting through a stored-energy mechanism in a precompressed spring, which trips with a force of 120 N (120 kp), large enough to even open disconnecting switches which have not been operated during an extended period of time, thus presenting friction and resistance due to dust, dirt and corrosion (refer to Figure 3 in the Fuse Manual).

## **High interrupting capacity:**

**DRIWISA™** fuses display a high interrupting capacity which permits the interruption of very high short-circuit currents (refer to Figure 6 in the Fuse Manual).

## **Selectivity and protection coordination:**

Maintaining a ratio of 1:1.6 between fuses installed in series the right coordination and protection selectivity is achieved, which makes isolation and fault-detection easy. Unnecessary power interruptions can be avoided (refer to section "Selection" in the Fuse Manual).

## **Special sealing of fuses for outdoor service:**

The sealing of the fuses is accomplished by the use of special epoxic resins to avoid moisture penetration. For outdoor service fuses a special weld is used to perfectly seal against humidity.

## **Repair with factory warranty:**

Due to their special design and construction **DRIWISA™** fuses are the only ones that permit repairing in the factory, guaranteeing their original characteristics, when the porcelain tube has not been damaged. This means an interesting economic saving feature and an alternative for recycling materials, as a contribution to the environment protection.

## **Immediate availability:**

Due to the large distribution network set up by DRIESCHER Y WITTJOHANN S.A. with authorized representatives located at strategic locations, **DRIWISA™** fuses are made available on short notice, thus representing a great advantage for the immediate replacement of used elements.

## **Technical support:**

DRIESCHER Y WITTJOHANN, S.A. offers her customers immediate technical support and advise when needed as for the proper selection of the right fuse for each particular case, to protect transformers, motors, capacitors, distribution lines and any other high voltage equipment, editing technical bulletins with complementary information on the fuses and on subjects related to their application, selection and maintenance.

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## SELECTION CHART

DRIESCHER Y WITTJOHANN, S.A. manufactures **DRIWISA™** fuses types DRS, DRK and DRN for the voltage and current ratings shown in the Tables of pages 5 to 11 with the interrupting capacities and dimensions given in the corresponding columns. The following versions are available:

TYPE	END-CODE	CHARACTERISTICS / APPLICATION
DRS	without end-code	Indoor service, with striker-pin from 2 Amperes. For transformer, motor and overhead lines and cable feeders protection. Commonly used in combination with load-break switches and vacuum contactors.
DRS....F	....F	Outdoor service, for polluted or humid environments. For transformer, motor and overhead lines and cable feeders protection.
DRK	without end-code	Indoor service, tapped end-caps, without striker pin. For capacitor protection. Screw-mounted on bushings.
DRN	without end-code	Indoor service, without striker-pin, 1, 2 and 4 Amperes only for potential transformer protection. They have special "e" lengths. For mounting on fuse-holders.

## General Data:

SERIE	MINIMUM VOLTAGE (phase to phase) kV	MAXIMUM VOLTAGE (phase to phase) kV
DR....04	2.4	4.8
DR....07	2.4	7.2
DR....12	7.2	12
DR....13	10	13.8
DR....15	10	17.5
DR....20	20	25.8
DR....30	25.8	38

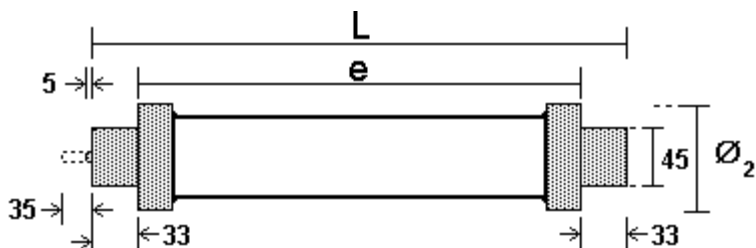
Selection criteria are chosen according to the application, as described in Technical Bulletins 201 to 205.

# DRIWISA™ HIGH VOLTAGE CURRENT-LIMITING FUSES HIGH INTERRUPTING CAPACITY INDOOR AND OUTDOOR USE



## General specifications

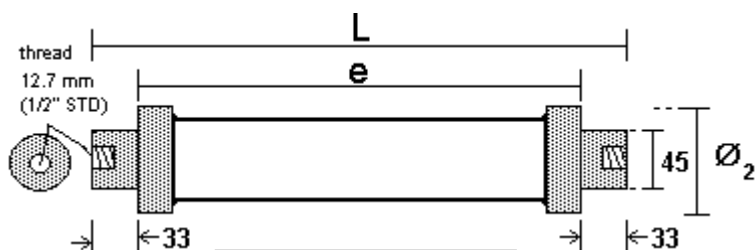
Fuse dimensions according to international standards.



**Type DRS and DRS...F**  
with striker-pin  
Indoor service: without end-code  
Outdoor service: with "F" end-code

	DRS..A	DRS..B	
Ø <sub>2</sub>	66 mm	85 mm	
e	size e		
	1	192 mm	
	2	292 mm	
	4	442 mm	
	5	537 mm	
L	e + 66 mm		

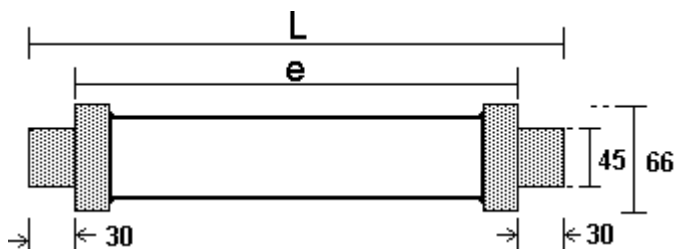
DW-2002



**Type DRK and DRK...F**  
without striker-pin  
For capacitor protection  
Indoor and outdoor service

	DRK..A	DRK..B	
Ø <sub>2</sub>	66 mm	85 mm	
e	size e		
	1	192 mm	
	2	292 mm	
	4	442 mm	
	5	537 mm	
L	e + 66 mm		

DW-2003



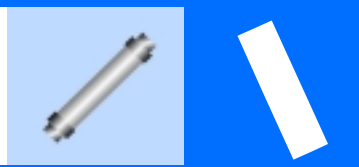
**Type DRN and DRN...F**  
without striker-pin  
Indoor service: without end-code  
Outdoor service: with "F" end-code  
For potential transformer protection. 1, 2 and 4 Amp.

	DRN		Voltage
	size	e	
e	1	162 mm	7.2 y 17.5 kV
	2	280 mm	25.8 kV
	4	433 mm	38 kV
L	e + 60 mm		

Dimensions in mm

DW-2001

# DRIWISA™ HIGH VOLTAGE CURRENT-LIMITING FUSES HIGH INTERRUPTING CAPACITY INDOOR AND OUTDOOR USE



Fuses with striker pin for transformer, motor and overhead lines and cable feeders protection.

TYPE	RATED	INTERRUPTING	MINIMUM	DIMENSIONS				WEIGHT approx. kg
	CURRENT $I_n$ A	CAPACITY $I_1$ kA	INTERRUPTING CURRENT $I_3$ A	e mm	L mm	$\varnothing_1$ mm	$\varnothing_2$ mm	
<b>Vmax = 13.8 kV</b>								
DRS13/002-A2	2	31.5	5	292	358	45	66	2.1
DRS13/004-A2	4	31.5	10	292	358	45	66	2.1
DRS13/006-A2	6	31.5	15	292	358	45	66	2.1
DRS13/010-A2	10	31.5	25	292	358	45	66	2.1
DRS13/016-A2	16	31.5	40	292	358	45	66	2.1
DRS13/025-A2	25	31.5	63	292	358	45	66	2.1
DRS13/032-A2	32	31.5	80	292	358	45	66	2.1
DRS13/040-A2	40	31.5	100	292	358	45	66	2.1
DRS13/050-A2	50	31.5	125	292	358	45	66	2.1
DRS13/063-A2	63	31.5	189	292	358	45	66	2.1
DRS13/075-B2	75	20	240	292	358	45	85	3.2
DRS13/100-B2	100	20	300	292	358	45	85	3.2
<b>Vmax = 17.5 kV</b>								
DRS15/002-A4	2	80	5	442	508	45	66	2.8
DRS15/004-A4	4	80	10	442	508	45	66	2.8
DRS15/006-A4	6	80	15	442	508	45	66	2.8
DRS15/010-A4	10	80	25	442	508	45	66	2.8
DRS15/016-A4	16	80	40	442	508	45	66	2.8
DRS15/025-A4	25	80	63	442	508	45	66	2.8
DRS15/032-A4	32	80	80	442	508	45	66	2.8
DRS15/040-A4	40	80	100	442	508	45	66	2.8
DRS15/050-A4	50	80	125	442	508	45	66	2.8
DRS15/063-A4	63	40	189	442	508	45	66	2.8
DRS15/075-B4	75	63	240	442	508	45	85	4.5
DRS15/100-B4	100	40	300	442	508	45	85	4.5
DRS15/125-B4	125	40	375	442	508	45	85	4.5
DRS15/160-B4	160	20	480	442	508	45	85	4.5
DRS15/200-B4	200	25	800	442	508	45	85	4.5
DRS15/200-B5	200	25	800	537	603	45	85	5.4
<b>Vmax = 25.8 kV</b>								
DRS20/002-A4	2	40	5	442	508	45	66	2.8
DRS20/004-A4	4	40	10	442	508	45	66	2.8
DRS20/006-A4	6	40	15	442	508	45	66	2.8
DRS20/010-A4	10	40	25	442	508	45	66	2.8
DRS20/016-A4	16	40	40	442	508	45	66	2.8
DRS20/025-A4	25	40	63	442	508	45	66	2.8
DRS20/032-A4	32	40	80	442	508	45	66	2.8
DRS20/040-A4	40	40	100	442	508	45	66	2.8
DRS20/050-A4	50	25	125	442	508	45	66	2.8
DRS20/063-A4	63	25	189	442	508	45	66	2.8
DRS20/063-B4	63	40	189	442	508	45	85	4.3
DRS20/075-B4	75	25	240	442	508	45	85	4.3
DRS20/100-B4	100	25	300	442	508	45	85	4.3
DRS20/125-B4	125	40	375	442	508	45	85	4.3
DRS20/160-B4	160	25	480	442	508	45	85	4.3
DRS20/125-B5	125	40	375	537	603	45	85	5.4
DRS20/160-B5	160	25	480	537	603	45	85	5.4

# DRIWISA™ HIGH VOLTAGE CURRENT-LIMITING FUSES HIGH INTERRUPTING CAPACITY INDOOR AND OUTDOOR USE



Fuses with striker pin for transformer, motor and overhead lines and cable feeders protection.

TYPE	RATED CURRENT $I_n$ A	INTERRUPTING CAPACITY $I_1$ kA	MINIMUM INTERRUPTING CURRENT $I_3$ A	DIMENSIONS				WEIGHT approx. kg
				e mm	L mm	$\varnothing_1$ mm	$\varnothing_2$ mm	
<b>Vmax = 4.8 kV</b>								
DRS04/125-B1	125	40	375	192	258	45	85	2.6
DRS04/160-B1	160	40	480	192	258	45	85	2.6
DRS04/125-B2	125	63	375	292	358	45	85	3.2
DRS04/160-B2	160	63	480	292	358	45	85	3.2
DRS04/200-B2	200	63	800	292	358	45	85	3.2
DRS04/250-B2	250	40	1000	292	358	45	85	3.2
DRS04/315-B2	315	40	1260	292	358	45	85	3.2
<b>Vmax = 7.2 kV</b>								
DRS07/002-A1	2	40	5	192	258	45	66	1.5
DRS07/004-A1	4	40	10	192	258	45	66	1.5
DRS07/006-A1	6	40	15	192	258	45	66	1.5
DRS07/010-A1	10	40	25	192	258	45	66	1.5
DRS07/016-A1	16	40	40	192	258	45	66	1.5
DRS07/025-A1	25	40	63	192	258	45	66	1.5
DRS07/032-A1	32	40	80	192	258	45	66	1.5
DRS07/040-A1	40	40	100	192	258	45	66	1.5
DRS07/050-A1	50	40	125	192	258	45	66	1.5
DRS07/063-A1	63	40	189	192	258	45	66	1.5
DRS07/075-A1	75	40	240	192	258	45	66	1.5
DRS07/100-A1	100	40	300	192	258	45	66	1.5
<b>Vmax = 7.2 kV</b>								
DRS07/002-A2	2	63	5	292	358	45	66	2.1
DRS07/004-A2	4	63	10	292	358	45	66	2.1
DRS07/006-A2	6	63	15	292	358	45	66	2.1
DRS07/010-A2	10	63	25	292	358	45	66	2.1
DRS07/016-A2	16	63	40	292	358	45	66	2.1
DRS07/025-A2	25	63	63	292	358	45	66	2.1
DRS07/032-A2	32	63	80	292	358	45	66	2.1
DRS07/040-A2	40	63	100	292	358	45	66	2.1
DRS07/050-A2	50	63	125	292	358	45	66	2.1
DRS07/063-A2	63	63	189	292	358	45	66	2.1
DRS07/075-A2	75	63	240	292	358	45	66	2.1
DRS07/100-A2	100	63	300	292	358	45	66	2.1
DRS07/100-B4	100	63	300	442	508	45	85	4.5
DRS07/125-B4	125	40	375	442	508	45	85	4.5
DRS07/160-B4	160	40	480	442	508	45	85	4.5
DRS07/200-B4	200	63	800	442	508	45	85	4.5
DRS07/250-B4	250	40	1000	442	508	45	85	4.5
DRS07/315-B4	315	40	1260	442	508	45	85	4.5
DRS07/400-B4	400	20	1600	442	508	45	85	4.5
DRS07/500-B4	500	20	2000	442	508	45	85	4.5
<b>Vmax = 12 kV</b>								
DRS12/125-B2	125	63	375	292	358	45	85	3.1
DRS12/160-B2	160	63	480	292	358	45	85	3.1
DRS12/200-B2	200	63	800	292	358	45	85	3.1

# DRIWISA™ HIGH VOLTAGE CURRENT-LIMITING FUSES HIGH INTERRUPTING CAPACITY INDOOR AND OUTDOOR USE



## Fuse selection chart for transformer protection:

- 1.- Determine the system voltage in kV.
- 2.- Determine the transformer power in kVA.
- 3.- Find the rated current of the fuse (In) on the table below, in the intersection of the voltage column and the transformer power row.

Power in kVA	Operation voltage in kV												Comments	
	2.4	4.16	4.8	7.2	13.2	13.8	15	17.5	23	25.8	34.5	36		
	Serie 07				Serie 15				Serie 20		Serie 30			
15	10	4	4	4	2	2	1	1	1	1	1	1	Fuse without striker-pin (1,2,4 Amp)	
30	16	10	10	6	4	4	2	2	2	2	1	1		
45	25	16	10	10	4	4	4	4	4	2	2	2		
75	40	25	25	16	6	6	6	6	4	4	4	4		
112.5	63	32	32	25	10	10	10	10	6	6	4	4	Standard Fuse with striker-pin (from 2 Amp)	
150	75	40	40	25	16	16	16	10	10	6	6	6		
225	125	63	63	40	25	25	25	16	16	10	10	10		
300	160	100	75	50	32	25	25	25	16	16	10	10		
400	200	125	100	75	40	40	32	32	25	25	16	16		
500	250	160	125	100	50	40	40	32	25	25	16	16		
750	400	200	200	125	75	63	63	50	40	40	25	25		
1000	500	315	250	160	100	100	100	75	50	50	40	32		
1250	2x315	400	315	200	125	125	100	100	63	63	50	40		One fuse per-phase
1500	==	500	400	250	160	125	125	100	75	75	50	50		
2000	==	2x315	500	400	200	160	160	160	100	100	75	75		
2500	==	==	2x315	400	2x125	200	200	200	125	125	100	100		
3000	==	==	==	500	2x160	2x160	2x125	200	160	160	100	100	Two fuses per-phase	
3750	==	==	==	2x315	2x200	2x160	2x160	2x125	2x100	2x100	2x63	2x63		
5000	==	==	==	==	==	==	2x200	2x200	2x160	2x125	2x100	2x100	Circuit-breaker required	
7500	==	==	==	==	==	==	==	==	==	==	==	==		
10000	==	==	==	==	==	==	==	==	==	==	==	==		

Rated fuse current (In) in Amperes

- 4.- For cases not considered in the table, calculate the fuse rated current using the formula below:

$$I_n = 1.155 \times \frac{\text{kVA}}{\text{kV}}$$

- 5.- Choose the next higher current rating from the table below:

### Standardized fuse current ratings (In)

1	2	4	6	10	16	25	32	40	50	63	75	100	125	160	200	250	315	400	500												
Serie 30: 30...38 kV																															
Serie 20: 20...25.8 kV																															
Serie 15: 12...17.5 kV																															
Serie 07: 2.4...7.2 kV																															

- 6.- Consult the fuse Selection Charts and determine the corresponding type.

- 7.- For further details consult Technical Bulletin 201.

# Melting Time-Current Characteristics

p/n DR series DIN  
vAC 4.8-38kV  
I.R kA

