DRIESCHER Y WITTJOHANN, S.A.
Medium Voltage Solutions

DRIWISA

TECHNICAL SPECIFICATION

HIGH VOLTAGE CURRENT LIMITING FUSES

TYPE DRS & DRK

Contents

1. General Features

High voltage current limiting fuses DRIWISA® type DRS & DRK are used in medium voltage systems from 4.16 kV up to 38 kV, fulfilling the followings applications:

- Independent protection elements when the fuses are installed in single pole and three pole fuse holders on air DRIWISA type SP and DSP.
- Combinations protections elements in SF6 and air switches.
- Transformers, gears and underground cables protection.
- Potential transformers and capacitors banks protections (type DRK).

High voltage current limiting fuses DRIWISA® type DRS & DRK complies with the following requirements:

- Back-up fuses complain with the standards IEC 60282-1 y NMX-J-149-1.
- Fuses with a striker pin mechanism to operate other protection devices (DRS fuses).
- Fuses must not expel gases or any incandescent material that damage other equipment during the fuse operation (short circuit).
- In outdoors facilities the fuses shall be safeguarded against moisture.

High voltage current limiting fuses DRIWISA® type DRS & DRK can be installed in medium voltage indoor and outdoor compact substation and in air lines using DRIWISA fuse holders with outdoor fuses.

2. Standards

High voltage current limiting fuses DRIWISA® type DRS & DRK comply with the following standards:

NMX-J-098	Sistemas eléctricos de potencia-suministro-tensiones eléctricas normalizadas
NMX-J-068	Tableros de alta tensión
NMX-J-149/1	Fusibles alta tensión-parte 1: cortacircuitos - fusibles limitadores de corriente
IEC 62271-1	Common specifications
IEC 62271-103	Switches for rated voltages above 1 kv and less than 52 kv
IEC 62271-105	Alternating current switch-fuse combinations
IEC 62271-200	Ac metal-enclosed switchgear and control gear for rated voltages above 1 kv and up to and including 52 kv
IEC 60273	Characteristics of indoor and outdoor post insulators for systems with nominal voltages greater than 1000 v
IEC 60282-1	High-voltage fuses - Part 1: Current-limiting fuses
ANSI C37.22	Preferred ratings and related required capabilities for indoor ac medium-voltage switches used in metal-enclosed switchgear
IEEE STD C37.20.4-2001	Standard for indoor ac switches (1 kv–38 kv) for use in metal-enclosed switchgear

3. Service Conditions

High voltage current limiting fuses DRIWISA® type DRS & DRK are able to operate within the range of the following environment conditions:

Temperature: -10 ºC / +40 ºC.
Relative Humidity: < 60% [1]
Altitude: 0 - 1000 msnm [2]

1 For outdoor service applications fuses with an anti-humidity seal should be used.
2 For higher installation heights must apply the appropriate correction factor. (IEC 60694)

The enclosure, metal enclosure substation or board, must have the appropriate NEMA or IP degree protection to secure the specified temperature or humidity conditions and keep the inside air free of smoke, gases, water, corrosive or explosive steamers and electrically conductive particles (dust).

IEC 60529 Degrees of protection provided by enclosures (IP Code).

NEMA 250 Enclosures for electrical equipment (1000 volts maximum).

4. Characteristics

High voltage current limiting fuses DRIWISA® type DRS & DRK comply with the following electrical values (according to the standards of Section 2):

Maximum Voltage	Rated Current	Interruptive Capacity	Rated Interruption Current	Dimensions				Weight (approx.)
	In	I_1	I_3	e	L	$\varnothing_1$	$\varnothing_2$	
KV	**A**	**kA**	**A**	**mm**	**mm**	**mm**	**mm**	**kg**
4.8	125	40	375	192	258	45	85	2.6
	125	63	375	292	358	45	85	3.2
	160	40	480	192	258	45	85	2.6
	160	63	480	292	358	45	85	3.2
	200	63	800	292	358	45	85	3.2
	250	40	1000	292	358	45	85	3.2
	250 *	40	750	192	258	45	85	5.4
	315	40	1260	292	358	45	85	3.2
	315 *	40	960	192	258	45	85	5.4
	400 *	63	1600	292	358	45	85	6.4
	500 *	40	2000	292	358	45	85	6.4
	630 *	40	2520	292	358	45	85	6.4

*Applies for dual fuses.

Maximum Voltage	Rated Current	Interruptive Capacity	Rated Interruption Current	Dimensions				Weight (approx.)
	In	I_1	I_3	e	L	$\varnothing_1$	$\varnothing_2$	
KV	**A**	**kA**	**A**	**mm**	**mm**	**mm**	**mm**	**kg**
	2	40	5	192	258	45	66	1.5
	2	63	5	292	358	45	66	2.1
	4	40	10	192	258	45	66	1.5
	4	63	10	292	358	45	66	2.1
	6	40	15	192	258	45	66	1.5
	6	63	15	292	358	45	66	2.1
	10	40	25	192	258	45	66	1.5
	10	63	25	292	358	45	66	2.1
	16	40	40	192	258	45	66	1.5
	16	63	40	292	358	45	66	2.1
	25	40	63	192	258	45	66	1.5
	25	63	63	292	358	45	66	2.1
	32	40	80	192	258	45	66	1.5
	32	63	80	292	358	45	66	2.1
	40	40	100	192	258	45	66	1.5
	40	63	100	292	358	45	66	2.1
	50	40	125	192	258	45	66	1.5
	50	63	125	292	358	45	66	2.1
	63	40	189	192	258	45	66	1.5
7.2	63	63	189	292	358	45	66	2.1
	75	40	240	192	258	45	66	1.5
	75	63	240	292	358	45	66	2.1
	100	40	300	192	258	45	66	1.5
	100	63	300	292	358	45	66	2.1
	100	63	300	442	508	45	85	4.5
	125 *	63	378	292	358	45	66	4.4
	125	40	375	442	508	45	85	4.5
	150 *	63	480	292	358	45	66	4.4
	160	40	480	442	508	45	85	4.5
	200 *	63	600	292	358	45	66	4.4
	200	63	800	442	508	45	85	4.5
	250	40	1000	442	508	45	85	4.5
	315	40	1260	442	508	45	85	4.5
	315 *	63	960	442	508	45	85	9.4
	400	20	1600	442	508	45	85	4.5
	400 *	63	1600	442	508	45	85	9.4
	500	20	2000	442	508	45	85	4.5
	500 *	40	2000	442	508	45	85	9.4
	630 *	40	2520	442	508	45	85	9.4

* Applies for dual fuses.

Maximum Voltage	Rated Current	Interruptive Capacity	Rated Interruption Current	Dimensions				Weight (approx.)
	In	I_1	I_3	e	L	$\varnothing_1$	$\varnothing_2$	
KV	**A**	**kA**	**A**	**mm**	**mm**	**mm**	**mm**	**kg**
12	125	63	375	292	358	45	85	3.1
	160	63	480	292	358	45	85	3.1
	200	63	800	292	358	45	85	3.1
	250 *	63	750	292	358	45	85	6.4
	315 *	40	960	292	358	45	85	6.4
	400 *	40	1600	292	358	45	85	6.4
13.8	2	32	5	292	358	45	66	2.1
	4	32	10	292	358	45	66	2.1
	6	32	15	292	358	45	66	2.1
	10	32	25	292	358	45	66	2.1
	16	32	40	292	358	45	66	2.1
	25	32	63	292	358	45	66	2.1
	32	32	80	292	358	45	66	2.1
	40	32	100	292	358	45	66	2.1
	50	32	125	292	358	45	66	2.1
	63	32	189	292	358	45	66	2.1
	75	20	240	292	358	45	85	3.2
	100	20	300	292	358	45	85	3.2
	125 *	32	378	292	358	45	66	4.4
	150 *	20	480	292	358	45	85	6.4
	200 *	20	600	292	358	45	85	6.4
17.5	2	80	5	442	508	45	66	2.8
	4	80	10	442	508	45	66	2.8
	6	80	15	442	508	45	66	2.8
	10	80	25	442	508	45	66	2.8
	16	80	40	442	508	45	66	2.8
	25	80	63	442	508	45	66	2.8
	32	80	80	442	508	45	66	2.8
	40	80	100	442	508	45	66	2.8
	50	80	125	442	508	45	66	2.8
	63	40	189	442	508	45	66	2.8
	75	63	240	442	508	45	85	4.5
	100	40	300	442	508	45	85	4.5
	125	40	375	442	508	45	85	4.5
	160	20	480	442	508	45	85	4.5
	200	25	800	442	508	45	85	4.5
	200	25	800	537	603	45	85	5.4
	250 *	40	750	442	508	45	85	9.4
	315 *	40	960	442	508	45	85	9.4
	400 *	20	1600	442	508	45	85	9.4
	400 *	25	1600	537	603	45	85	11.0

* Applies for dual fuses.

Maximum Voltage	Rated Current	Interruptive Capacity	Rated Interruption Current	Dimensions				Weight (approx.)
	In	I_1	I_3	e	L	$\varnothing_1$	$\varnothing_2$	
KV	**A**	**kA**	**A**	**mm**	**mm**	**mm**	**mm**	**kg**
25.8	2	40	5	442	508	45	66	2.8
	4	40	10	442	508	45	66	2.8
	6	40	15	442	508	45	66	2.8
	10	40	25	442	508	45	66	2.8
	16	40	40	442	508	45	66	2.8
	25	40	63	442	508	45	66	2.8
	32	40	80	442	508	45	66	2.8
	40	40	100	442	508	45	66	2.8
	50	25	125	442	508	45	66	2.8
	63	25	189	442	508	45	66	2.8
	63	40	189	442	508	45	85	4.3
	75	25	240	442	508	45	85	4.3
	100	25	300	442	508	45	85	4.3
	125	40	375	442	508	45	85	4.3
	125	40	375	537	603	45	85	5.4
	160	25	480	442	508	45	85	4.3
	160	25	480	537	603	45	85	5.4
	200 *	25	600	442	508	45	85	9.4
	250 *	20	750	442	508	45	85	9.4
	250 *	40	750	537	603	45	85	11.0
	315 *	20	960	442	508	45	85	9.4
	315 *	25	960	537	603	45	85	11.0
38	2	32	5	537	603	45	66	3.3
	4	32	10	537	603	45	66	3.3
	6	32	15	537	603	45	66	3.3
	10	32	25	537	603	45	66	3.3
	16	32	40	537	603	45	66	3.3
	25	32	63	537	603	45	66	3.3
	32	32	80	537	603	45	66	3.3
	40	32	100	537	603	45	66	3.3
	50	32	125	537	603	45	66	3.3
	63	16	189	537	603	45	66	3.3
	75	20	240	537	603	45	85	5.4
	100	20	300	537	603	45	85	5.4
	125 *	16	378	537	603	45	66	6.8
	150 *	20	480	537	603	45	85	11.0
	200 *	20	600	537	603	45	85	11.0

* Applies for dual fuses.

5. Construction

High voltage current limiting fuses DRIWISA® type DRS & DRK are mainly constructed with the following elements:

5.1. Fuses Elements
The fuses are formed of one or several 99.9% pure silver strips are uniformly wound over a star shaped strip-holder (star-shaped body) built out of steatite (a ceramic material with great mechanical and thermal resistance).

5.2. Porcelain Body
Due to its tooth edge design, the star-shaped body guarantees the fuse links safe and firm position. It doesn't have conductive materials over the body.

5.3. Internal Support
Internal support with tooth edge design to support the silver strips and guaranty the distance between each other, ceramic support for high temperatures and high mechanical resistance to support thermal stress and electrodynamics short.

5.4. Voltaic Extinguish Arc
Between the porcelain tube and the star body, which keeps the fuse element fixed, the space is filled with silica sand to cool and extinguish the voltaic arc, causing the evaporated silver to solidify thus interrupting the short circuit. The previous process is only and exclusively executed with silver tape as copper tape does not achieve the stated safety effect.

5.5. Contacts

5.5.1. **TYPE DRS**: Are made of electrolytic cooper (99.9%) plated with 5 µm with 80% minimum of contact area. The contacts are designed with the standards in Section 2 and the dimensions in section 4.1.

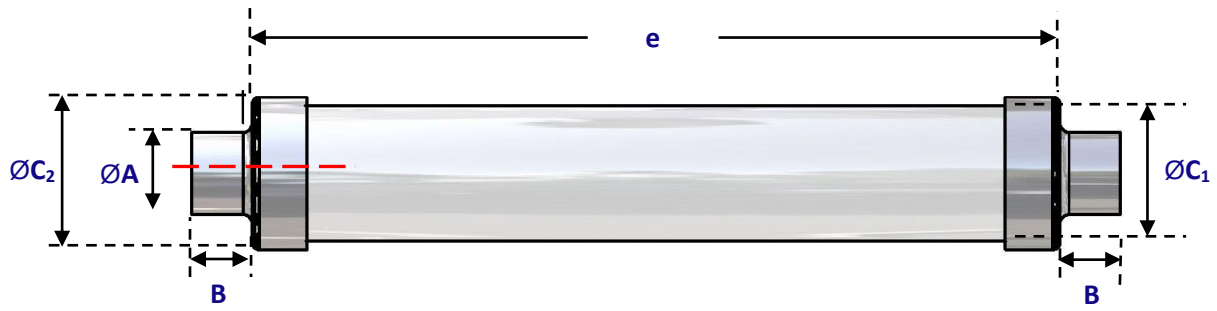
5.5.2. **TYPE DRK**: Are made of electrolytic cooper (99.9%) plated with 5 µm with 80% minimum of contact area, brass caps with a ½" UNC threads on each size. The contacts are designed with the standards in Section 2 and the dimensions in Section 4.1.

5.6. Stricker pin (Type DRS)
Material is steel (brass) resistant to the same elevations in temperature of the metallic or conductive parts in base of the standards in Section 2. The heavy striker pin (120 N) can be used in the load break switches or a striker pin (80 N) can be used in the SF6 DRIWISA.

6. Dimensions

High voltage current limiting fuses DRIWISA® type DRS & DRK complain with the following.

More information in our website http://www.driwisa.com



ØA	B	$ØC_2$ (minimum)	$ØC_1$ y $ØC_2$ (maximum)	e
45	33	50	88	192
				292
				442
				537

7. Technical Information

7.1. Drawings
Printed drawings are provided as required in letter size, multiple letter size or electronic format (2D or 3D).

7.2. User Manuals
Easily accessed on our website http://www.driwisa.com/manuales

8. Tests

8.1. Prototype test reports
We provide reports of prototype tests performed in accredited national laboratories (LAPEM) that guarantee the fulfillment of the values and capacities specified in Section 4.

8.2. Routine Tests
Routine tests are done to each high voltage current limiting fuses DRIWISA® type DRS & DRK. The routine tests are the following:

- Visual inspection
- Dimensional analysis
- Contact resistance
- Ohmic resistance

9. Marking

Each high voltage current limiting fuses DRIWISA® type DRS & DRK is indelibly marked, without using conductive materials, with the following data:

- Name of the manufacturer.
- Serial number.
- Type and model.
- Nominal voltage kV.
- Rated current A.
- Rated interruption current A.
- Interruptive capacity kA.
- Legend “Made in Mexico”.

10. Packing

High voltage current limiting fuses DRIWISA® type DRS & DRK is packaged individually in a box of adequate strength material to protect it during transport, handling and storage.

Each package is marked on the outside with the appointment in accordance with Section 9, identify the manufacturer and marked "Fragil, manéjese con cuidado".