



DC fuses for railway and rolling stock

Fuse-links specifically designed for DC link protection and heating systems in rolling stock. Silver melting elements provide high resistance to ageing, and the ceramic body construction gives improved cooling and resistance to cyclic loading — the phenomenon that typically causes unnecessary fuse operation in railway applications. The combination of low operating I^2t (for semiconductor protection) and low power dissipation (for energy efficiency in continuous operation) makes these fuses well suited for inverters, converters and DC distribution in trains, trams and metro vehicles.

Standards: IEC 60269-4 and IEC 60077-5 (railway applications).

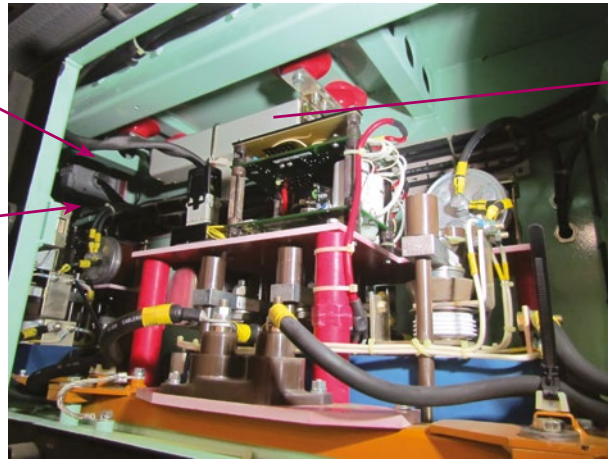
NH1S/394 – 4000V DC aR fuse-link

Rated voltage	4000V DC (L/R = 15ms), test voltage 4200V DC
Breaking capacity	30kA DC
Characteristic	aR
Standards	IEC 60269-4, IEC 60077-5
Application	Heating system in railway carriages

In [A]	Code No. with MK indicator	Code No. without MK indicator	Power dissipation [W]	Pre-arcing I^2t [A ² s]	Operating I^2t [A ² s] (L/R = 15ms)	Weight [g]
25	004735615	004735627	43	28	150	1800
32	004735616	004735628	65	40	300	1800
40	004735617	004735629	88	63	600	1800
50	004735618	004735630	105	112	1,400	1800
63	004735619	004735631	105	252	2,500	1800
80	004735620	004735632	114	494	5,500	1800
100	004735621	004735633	115	1,147	10,000	1800
125	004735622	004735634	132	2,168	19,000	1800
150	004735623	004735635	155	3,388	31,000	1800

Note: microswitch MK and adapter AMK1 must be ordered separately.

Fuses for railway applications



Advantages

ETI's Railway Fuses successfully combine two usually conflicting fuse requirements:

- ✓ **low operating joule integral**, necessary for the protection of semiconductors,
- ✓ **low power dissipation**, allowing for lower energy losses and thus **lower operating costs**, following the latest ecological trends.

These unique technical characteristics are achieved by a completely **new design of the ceramic body**, a special construction developed on the basis of long standing expert knowledge, which allows for significantly better cooling of the fuse.

The operation of fuses is especially **adapted for railway applications**, as they have **improved resistance to current cyclic loading**, a phenomenon that causes unnecessary fuse operating in these applications. This way, ETI's Railway Fuses help **decrease downtime** significantly, leading to further **cost savings** and **improved efficiency**.

The melting element inside Railway Fuses is made of silver, which makes them **highly insensitive to ageing** processes.

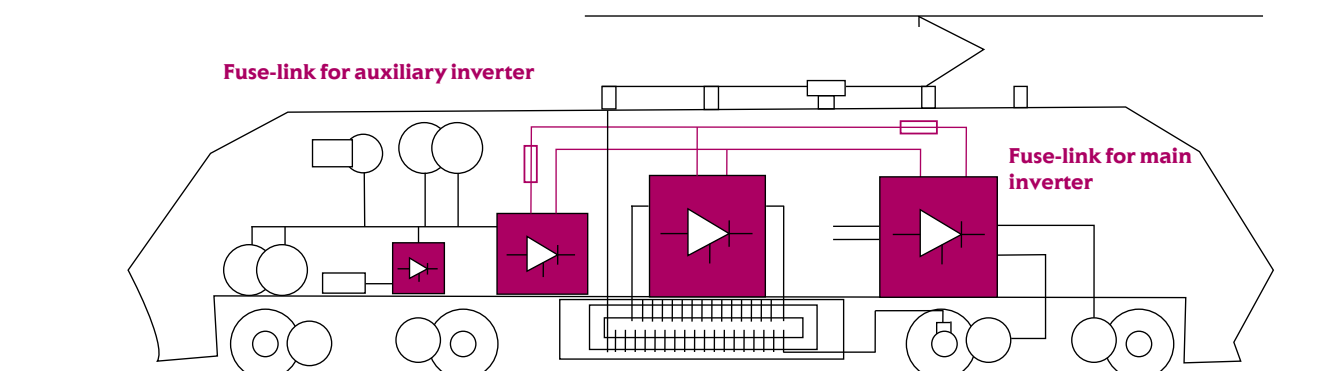
ETI Railway fuse-links ensure short circuit protection from minimum breaking capacity ($5 \times I_n$) up to maximum breaking capacity 30kA d.c. at time constant 15ms.

Application

Protection of DC link and semiconductor devices (diodes, thyristors, GTO) in railway inverters.

Standards

ETI Railway Fuses comply with the IEC 60269-4 and IEC 60077-5 standards.

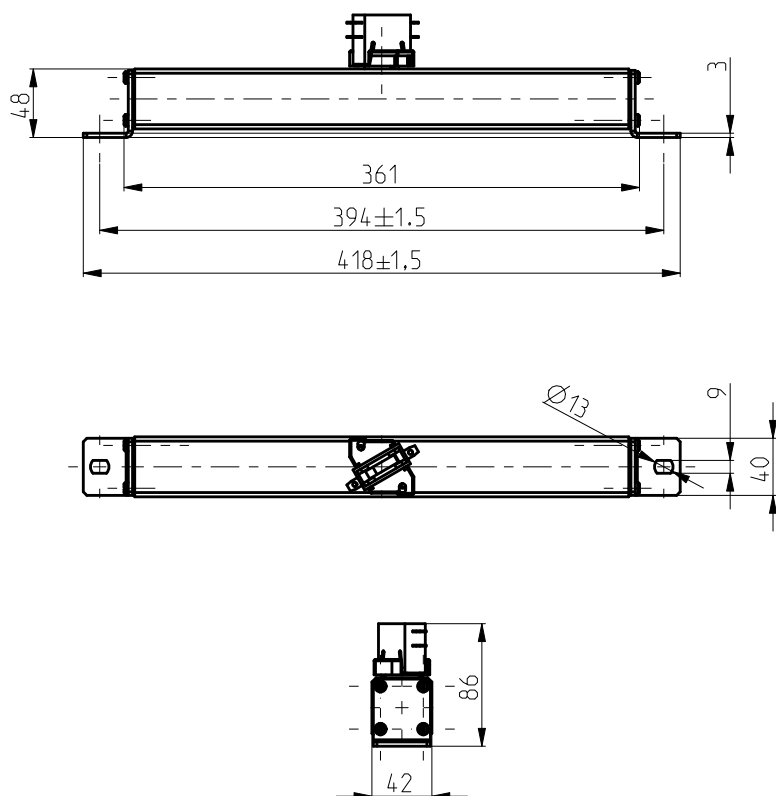


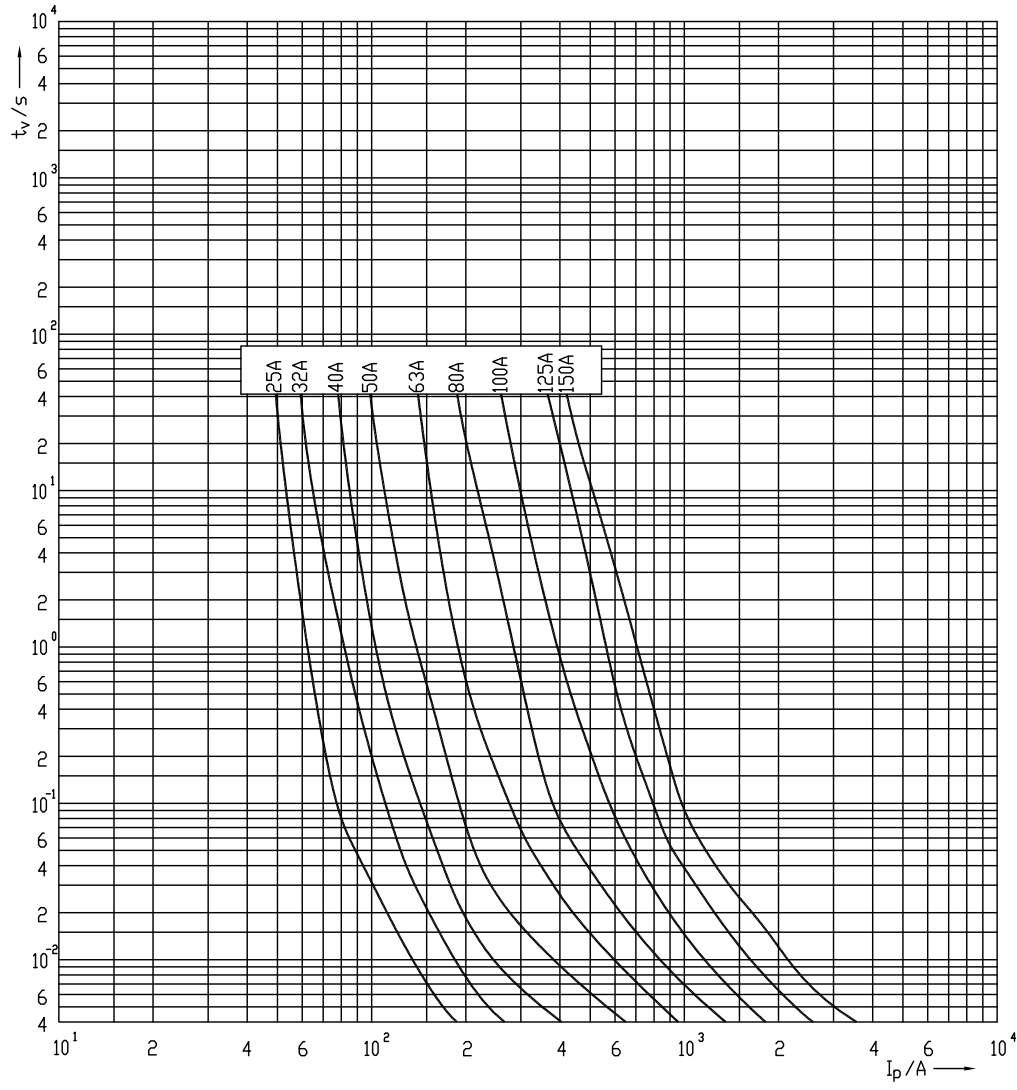
NH1S/394/DC 4000V aR-fuse link

General characteristics	
Rated voltage	4000V d.c. (L/R=15ms), rated test voltage 4200V d.c.
Breaking capacity	30kA d.c.
Characteristic	aR
Standards	IEC 60269-4, IEC 60077-5
Application	Heating system in railway vagon

RAILWAY fuse link							
I_n [A]	Code No. Type with centre trip indicator for microswitch MK	Code No. Type without centre trip indicator for microswitch MK	Power dissipation [W]	Pre-arcing Joule integral [A ² s]	Operating Joule integral [A ² s] (L/R=15ms)	Weight [g]	Pack. [pcs]
25	004735615	004735627	43	28	150	1800	1/1
32	004735616	004735628	65	40	300		
40	004735617	004735629	88	63	600		
50	004735618	004735630	105	112	1.400		
63	004735619	004735631	105	252	2.500		
80	004735620	004735632	114	494	5.500		
100	004735621	004735633	115	1.147	10.000		
125	004735622	004735634	132	2.168	19.000		
150	004735623	004735635	155	3.388	31.000		

Note: microswitch MK and adapter AMK1 must be ordered separately







NH2S/394 – 4000V DC aR fuse-link (coreless design)

The NH2S/394 uses a coreless fuse-link design, which allows for higher current ratings within the same envelope while maintaining the low operating I^2t needed for DC link protection of traction inverters.

Rated voltage	4000V DC (L/R = 15ms), test voltage 4200V DC
Breaking capacity	30kA DC
Characteristic	aR
Standards	IEC 60269-4, IEC 60077-5
Application	DC link protection of railway inverters

In [A]	Code No. with MK indicator	Code No. without MK indicator	Power dissipation [W]	Pre-arcing I^2t [A ² s]	Operating I^2t [A ² s] (L/R = 15ms)	Weight [g]
100	004735601	004735606	58	2,300	20,000	3500
125	004735602	004735607	82	3,700	33,000	3500
160	004735603	004735608	100	5,800	55,000	3500
200	004735604	004735609	127	10,000	100,000	3500
250	004735605	004735610	160	21,000	180,000	3500

Note: microswitch MK and adapter AMK2 must be ordered separately.

NH1/350 – 4000V DC aR fuse-link

Rated voltage	4000V DC (L/R = 15ms)
Breaking capacity	30kA DC
Characteristic	aR
Standards	IEC 60269-4, IEC 60077-5
Application	Heating system in railway carriages

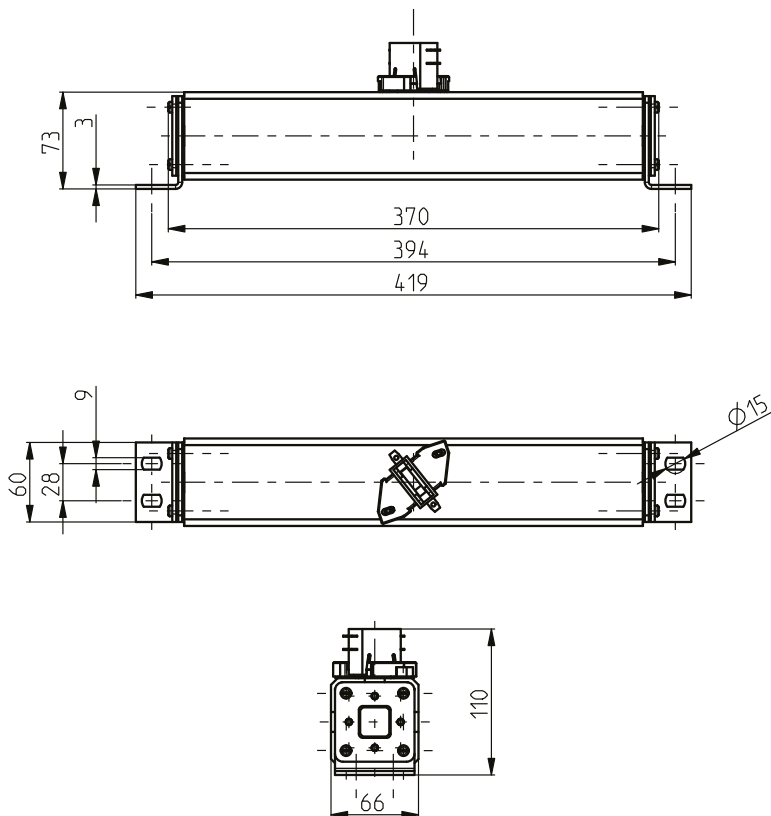
In [A]	Code No.	Power dissipation [W]	Pre-arcing I^2t [A ² s]	Operating I^2t [A ² s] (L/R = 15ms)	Weight [g]
25	004735636	43	28	150	1800
32	004735637	65	40	300	1800
40	004735638	88	63	600	1800
50	004735639	105	112	1,400	1800
63	004735640	105	252	2,500	1800
80	004735641	114	494	5,500	1800
100	004735642	115	1,147	10,000	1800
125	004735643	132	2,168	19,000	1800
150	004735644	155	3,388	31,000	1800

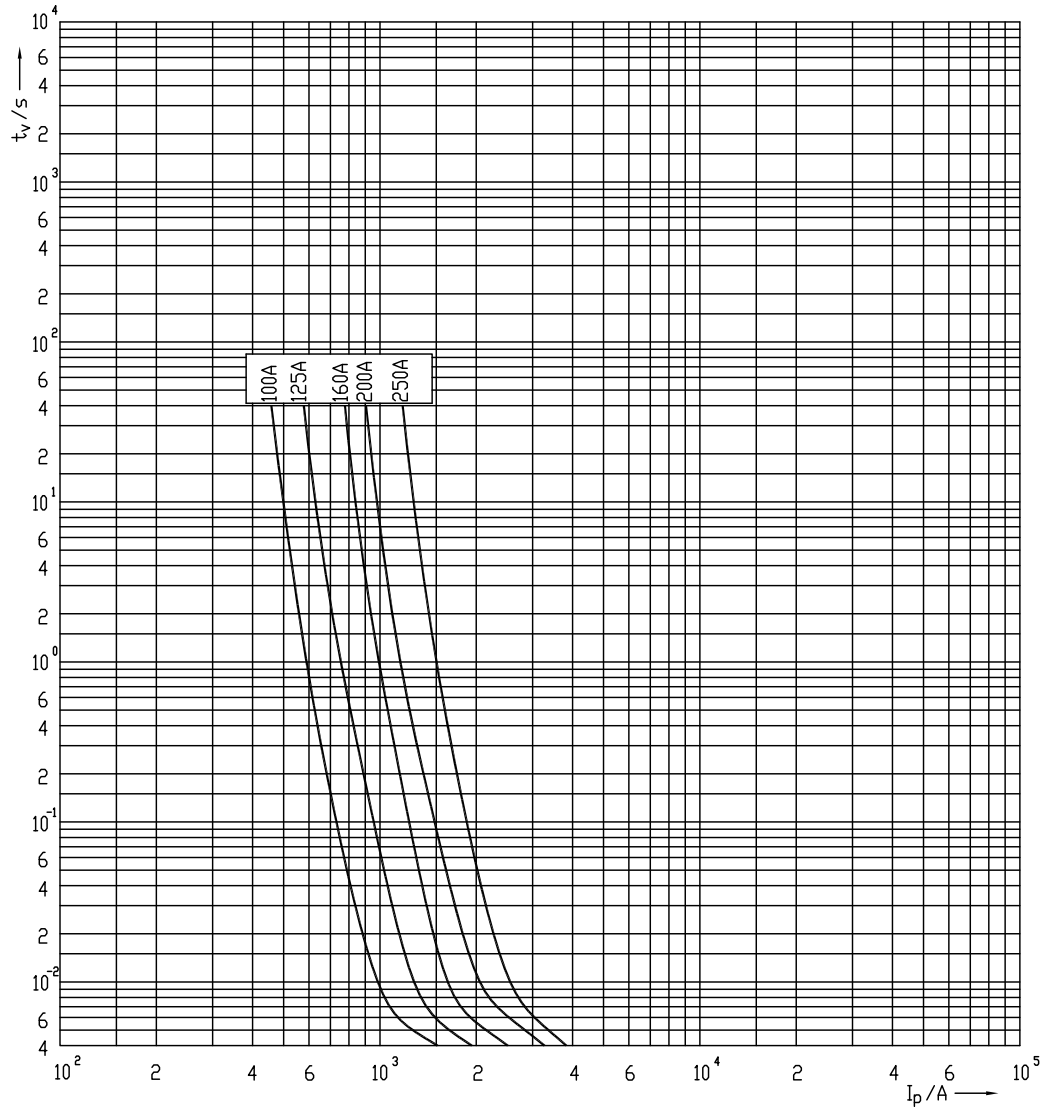
NH2 S/394/ DC 4000V aR - fuse link

General characteristics	
Rated voltage	4000V d.c. (L/R=15ms), rated test voltage 4200V d.c.
Breaking capacity	30kA d.c.
Characteristic	aR
Standards	IEC 60269-4, IEC 60077-5
Application	Fuse link for DC link protection of railway inverter.

RAILWAY fuse link							
I_n [A]	Code No. Type with centre trip indicator for microswitch MK	Code No. Type without centre trip indicator for microswitch MK	Power dissipation [W]	Pre-arcing Joule integral [A ² s]	Operating Joule integral [A ² s] (L/R=15ms)	Weight [g]	Pack. [pcs]
100	004735601	004735606	58	2.300	20.000	3500	1/1
125	004735602	004735607	82	3.700	33.000		
160	004735603	004735608	100	5.800	55.000		
200	004735604	004735609	127	10.000	100.000		
250	004735605	004735610	160	21.000	180.000		

Note: microswitch MK and adapter AMK2 must be ordered separately

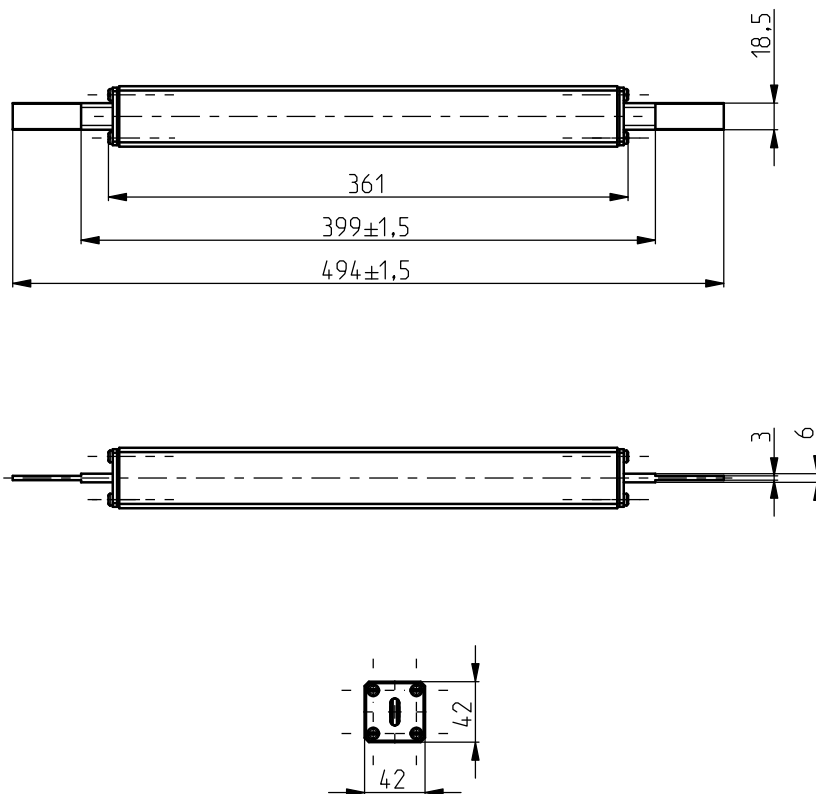


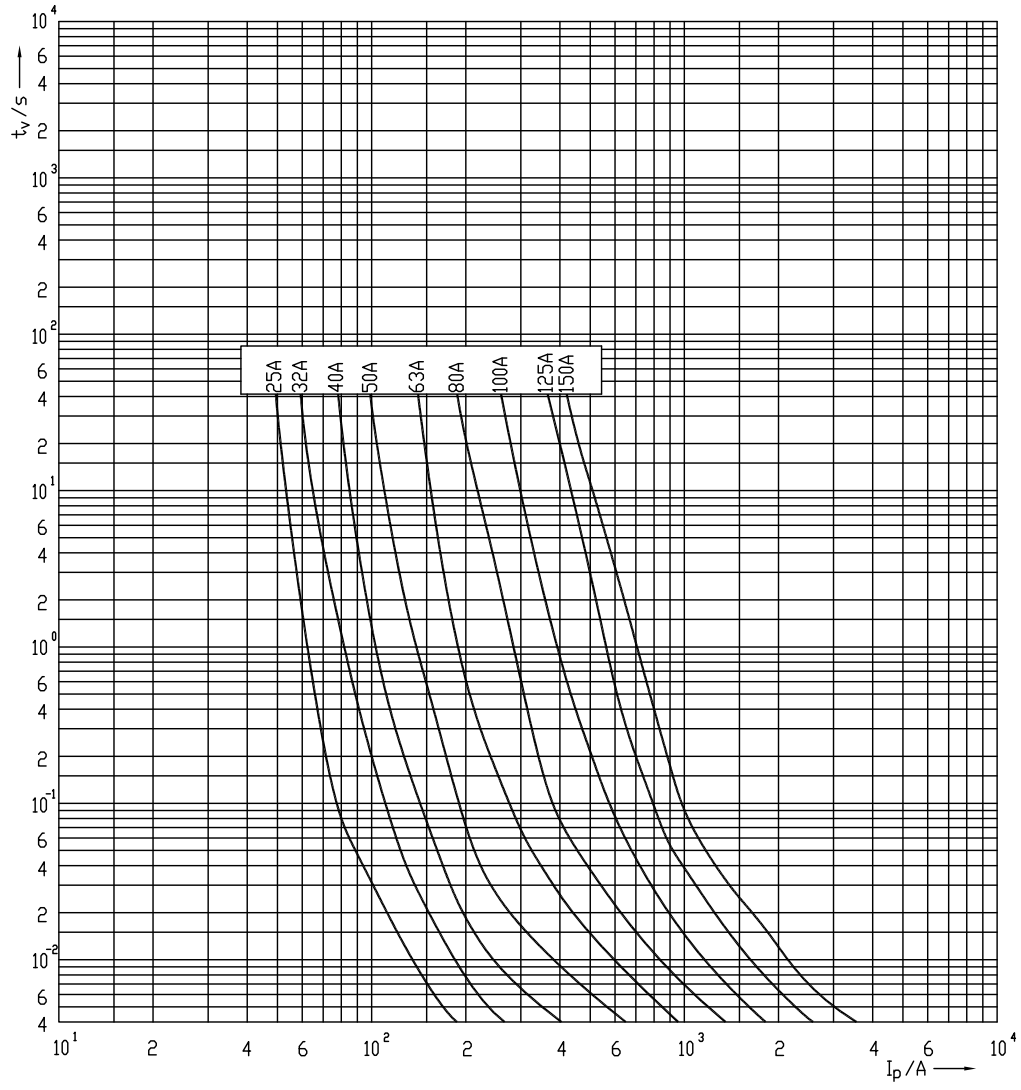


NH1 /350/DC 4000V aR-fuse link

General characteristics	
Rated voltage	4000V d.c. (L/R=15ms)
Breaking capacity	30kA d.c.
Characteristics	aR
Standard	IEC 60269-4, IEC 60077-5
Application	Heating system in railway vagon

RAILWAY fuse link						
I_n [A]	Code No.	Power dissipation [W]	Pre-arcing Joule integral [A ² s]	Operating Joule integral [A ² s] (L/R=15ms)	Weight [g]	Pack. [pcs]
25	004735636	43	28	150	1800	1/1
32	004735637	65	40	300		
40	004735638	88	63	600		
50	004735639	105	112	1.400		
63	004735640	105	252	2.500		
80	004735641	114	494	5.500		
100	004735642	115	1.147	10.000		
125	004735643	132	2.168	19.000		
150	004735644	155	3.388	31.000		







NH1/130 – 1000V DC gR fuse-link

The NH1/130 gR is designed for railway inverter protection with direct installation on copper busbars. The gR characteristic provides full-range protection — both short-circuit and overload — in a single fuse.

Rated voltage	1000V DC (L/R = 10ms)
Breaking capacity	30kA DC
Characteristic	gR
Standards	IEC 60269-4
Application	Railway inverter protection, mounted directly on copper busbars

In [A]	Code No.	Code No. with MK indicator	Power dissipation (0.7 × In) [W]	Power dissipation In [W]	Pre-arcing I ² t [A ² s]	Operating I ² t [A ² s] (L/R = 15ms)	Weight [g]
160	004303530	004303527	15.3	36.5	10,000	16,000	900
200	004303531	004303528	17.5	42.6	18,000	38,000	900
250	004303532	004303529	23.6	56	30,000	60,000	900

Note: microswitch MK and adapter AMK2 must be ordered separately.

Selection guide

DC link protection of traction inverters (main and auxiliary): NH2S/394 (100–250A) or NH1/130 (160–250A, 1000V) depending on system voltage.

Heating systems in railway carriages: NH1S/394 or NH1/350 (25–150A) at 4000V DC.

Semiconductor devices (diodes, thyristors, GTO, IGBT) in inverters: aR characteristic — low operating I²t ensures the fuse clears before the semiconductor is damaged.

Design features: silver melting element (high ageing resistance), ceramic body optimized for cooling, and construction adapted for cyclic loading typical of railway applications — reducing downtime and nuisance operations.

NH1 / 130 / DC 1000V gR - fuse link

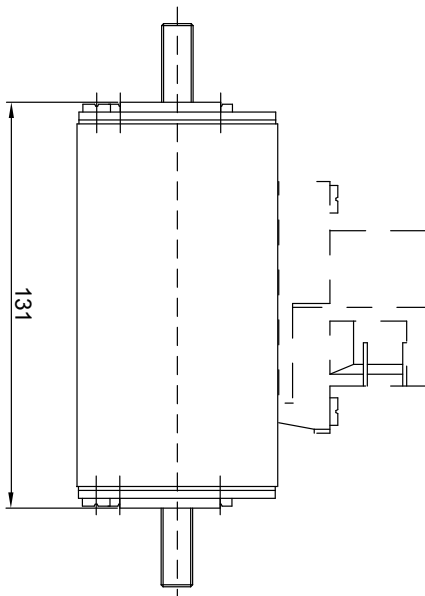
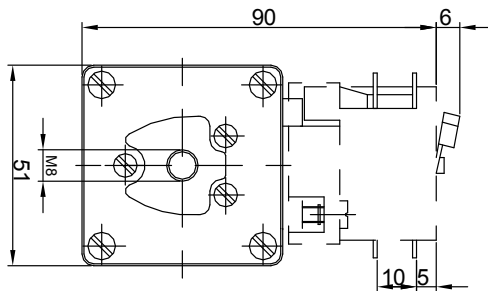
General characteristics

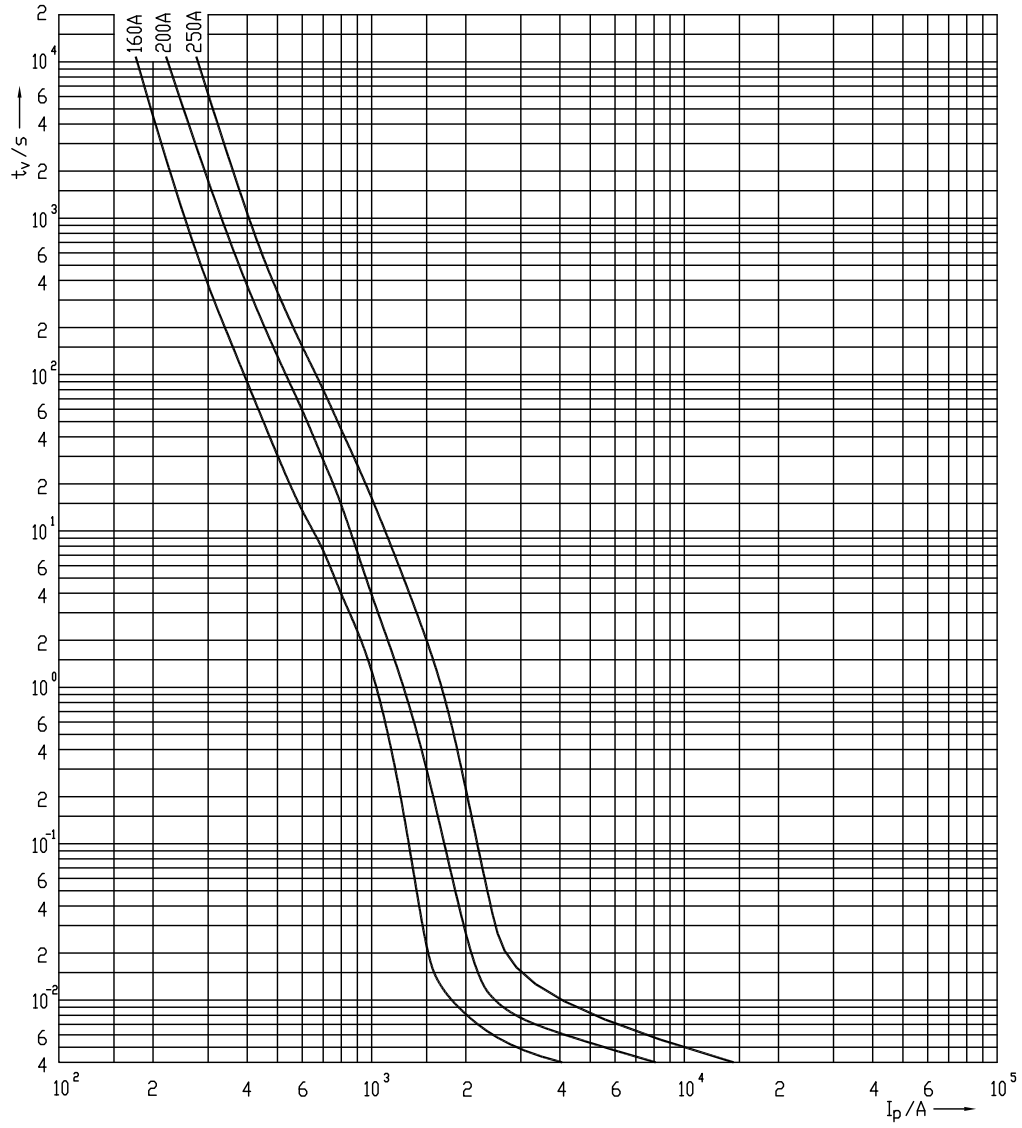
Rated voltage	1000V d.c. (L/R=10ms)
Breaking capacity	30kA d.c.
Characteristic	gR
Standards	IEC 60269-4
Application	Railway inverter protection Installation directly on copper rails.

RAILWAY fuse link

I_n [A]	Code No.	Code No. Type with centre trip indicator for microswitch MK+AMK2	Power dissipation ($0,7 \times I_n$) [W]	Power dissipation I_n [W]	Pre-arcing Joule integral [A ² s]	Operating Joule integral [A ² s] (L/R=15ms)	Weight [g]	Pack. [pcs]
160	004303530	004303527	15,3	36,5	10.000	16.000	900	1/16
200	004303531	004303528	17,5	42,6	18.000	38.000		
250	004303532	004303529	23,6	56	30.000	60.000		

Note: microswitch MK and adapter AMK2 must be ordered separately







About INKOM

Industrikomponenter AB (INKOM) has been supplying electromechanical and electronic components to Nordic industry, rail and new energy sectors since 1967. Our railway offering covers DC fuses, contactors, current and voltage sensors, and other safety-critical components for rolling stock and infrastructure.

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