

# POWR-SPEED® Fuse

## ESR Series High-Speed Square Body

Battery Protection Fuses • 1500 V Dc • Class aBat • 125 - 630 A

   **REACH HF**



### Description

The Littelfuse Energy Storage Rack (ESR) series of fuses is designed specifically to protect battery racks in energy storage systems, inverters, and many other dc applications. The 1500 V dc high-speed square body fuse is extremely fast-acting to respond quickly to a range of fault currents to safeguard the battery module or other devices.

This Class aBat partial range fuse has superior short circuit protection and a low minimum breaking capacity (MBC)—from 300 % or 3 times the fuse's rated current to 250 kA—to cover a range of over currents that traditional high-speed partial range fuses do not protect against.

The ESR fuse safely interrupts most faults in a battery storage system to avoid catastrophic failures and costly shutdowns.

### Features & Benefits

FEATURES	BENEFITS
<b>High dc interrupting rating</b>	Provides superior short-circuit protection and the ability to scale-up systems without the need to redesign the existing circuit protection, saving time and costs
<b>Low minimum breaking current</b>	Offers easy coordination with battery modules and reduces size and rating of dc contactors to save space and costs
<b>Extremely fast acting</b>	Delivers high-speed performance
<b>Low watt loss</b>	Maximizes efficiency by preventing energy loss and minimizing the wasted power of components
<b>Conforms to the IEC 60269-7 battery standard</b>	Specifically design to safeguard evolving battery technologies with fuse circuit protection
<b>Compact NH 1XL and 3XL size</b>	Saves space and offers design flexibility

### Applications

- Battery energy storage systems (BESSs)
  - Battery Protection Unit (BPU) and battery racks
- Power conversion systems
- Dc common bus systems
- Hybrid PV-BESS inverters

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### Specifications

<b>Voltage Rating</b>	1500 V dc
<b>Amperage Rating</b>	125 - 630 A
<b>Interrupting Rating</b>	250 kA
<b>Time Constant</b>	</= 3 ms
<b>Mounting</b>	Bolted-blade style, DIN-blade style
<b>Material</b>	Body: ceramic Contacts: plated copper (bladed)
<b>Applicable Standards</b>	UL 248-13, IEC 60269-7
<b>Environmental</b>	RoHS Compliant, REACH, Halogen Free
<b>Operating Temperature</b>	-55 °C to +125 °C (-67 °F to +257 °F)
<b>Storage Temperature</b>	Up to +35 °C (+95 °F) with relative humidity <65 %
<b>Country of Origin</b>	Mexico

### Certification & Compliance

<b>cURus</b>	cURus Recognized (File: E71611)
<b>CE</b>	EU_DOC-ESR_DB_UB_240201
<b>RoHS</b>	RoHS 2 Directive 2011/65/EU/ Directive (EU) 2015/863
<b>REACH</b>	Regulation (EC) 1907/2006
<b>Halogen Free</b>	Yes

### Ordering Information - DIN Blade

CASE SIZE	CATALOG NUMBER	ORDERING NUMBER	UPC	BOX QUANTITY	WEIGHT
NH 1XL	ESR1XLDB0125	ESR1XLDB0125X	07945830630	1 pc/box	2.2 lbs. (998 g.)
NH 1XL	ESR1XLDB0160	ESR1XLDB0160X	07945837030	1 pc/box	2.2 lbs. (998 g.)
NH 1XL	ESR1XLDB0200	ESR1XLDB0200X	07945837032	1 pc/box	2.2 lbs. (998 g.)
NH 1XL	ESR1XLDB0250	ESR1XLDB0250X	07945837782	1 pc/box	2.2 lbs. (998 g.)
NH 3XL	ESR3XLDB0250	ESR3XLDB0250X	07945837033	1 pc/box	4.4 lbs. (1996 g.)
NH 3XL	ESR3XLDB0315	ESR3XLDB0315X	07945837034	1 pc/box	4.4 lbs. (1996 g.)
NH 3XL	ESR3XLDB0350	ESR3XLDB0350X	07945837035	1 pc/box	4.4 lbs. (1996 g.)
NH 3XL	ESR3XLDB0400	ESR3XLDB0400X	07945837036	1 pc/box	4.4 lbs. (1996 g.)
NH 3XL	ESR3XLDB0450	ESR3XLDB0450X	07945837037	1 pc/box	4.4 lbs. (1996 g.)
NH 3XL	ESR3XLDB0500	ESR3XLDB0500X	07945837038	1 pc/box	4.4 lbs. (1996 g.)
NH 3XL	ESR3XLDB0550	ESR3XLDB0550X	07945837780	1 pc/box	4.4 lbs. (1996 g.)
NH 3XL	ESR3XLDB0630	ESR3XLDB0630X	07945837778	1 pc/box	4.4 lbs. (1996 g.)

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### Ordering Information - Bolted Blade

CASE SIZE	CATALOG NUMBER	ORDERING NUMBER	UPC	BOX QUANTITY	WEIGHT
NH 1XL	ESR1XLUB0125	ESR1XLUB0125X	07945830629	1 pc/box	2.2 lbs. (998 g.)
NH 1XL	ESR1XLUB0160	ESR1XLUB0160X	07945837039	1 pc/box	2.2 lbs. (998 g.)
NH 1XL	ESR1XLUB0200	ESR1XLUB0200X	07945837040	1 pc/box	2.2 lbs. (998 g.)
NH 1XL	ESR1XLUB0250	ESR1XLUB0250X	07945837781	1 pc/box	2.2 lbs. (998 g.)
NH 3XL	ESR3XLUB0250	ESR3XLUB0250X	07945837042	1 pc/box	4.4 lbs. (1996 g.)
NH 3XL	ESR3XLUB0315	ESR3XLUB0315X	07945837043	1 pc/box	4.4 lbs. (1996 g.)
NH 3XI	ESR3XLUB0350	ESR3XLUB0350X	07945837044	1 pc/box	4.4 lbs. (1996 g.)
NH 3XL	ESR3XLUB0400	ESR3XLUB0400X	07945837045	1 pc/box	4.4 lbs. (1996 g.)
NH 3XL	ESR3XLUB0450	ESR3XLUB0450X	07945837046	1 pc/box	4.4 lbs. (1996 g.)
NH 3XL	ESR3XLUB0500	ESR3XLUB0500X	07945837048	1 pc/box	4.4 lbs. (1996 g.)
NH 3XL	ESR3XLUB0550	ESR3XLUB0550X	07945837779	1 pc/box	4.4 lbs. (1996 g.)
NH 3XL	ESR3XLUB0630	ESR3XLUB0630X	07945837777	1 pc/box	4.4 lbs. (1996 g.)

### Electrical Specifications

CASE SIZE	CATALOG NUMBER		AMPERE RATING (A)	VOLTAGE RATING (V)	INTERRUPTING RATING	MINIMUM BREAKING CAPACITY (A)	MELTING (PRE-ARC) I <sup>2</sup> T (A <sup>2</sup> S)	TOTAL CLEARING I <sup>2</sup> T (A <sup>2</sup> S) AT RATED VOLTAGE	WATTS LOSS AT 100 % RATED CURRENT (W)	AGENCY CERTIFICATION
	BOLTED BLADE (UB)	DIN BLADE (DB)		DC	DC			DC		cURus
NH 1XL	ESR1XLUB0125	ESR1XLDB0125	125	1500	250 kA	375	1850	30700	53	•
NH 1XL	ESR1XLUB0160	ESR1XLDB0160	160	1500	250 kA	480	3400	48400	50	•
NH 1XL	ESR1XLUB0200	ESR1XLDB0200	200	1500	250 kA	600	5100	62800	89	•
NH 1XL	ESR1XLUB0250	ESR1XLDB0250	250	1500	250 kA	750	9000	95300	107	•
NH 3XL	ESR3XLUB0250	ESR3XLDB0250	250	1500	250 kA	750	9500	143400	96	•
NH 3XL	ESR3XLUB0315	ESR3XLDB0315	315	1500	250 kA	945	17500	279500	102	•
NH 3XL	ESR3XLUB0350	ESR3XLDB0350	350	1500	250 kA	1050	23000	232400	133	•
NH 3XL	ESR3XLUB0400	ESR3XLDB0400	400	1500	250 kA	1200	29000	324700	158	•
NH 3XL	ESR3XLUB0450	ESR3XLDB0450	450	1500	250 kA	1350	42000	581800	156	•
NH 3XL	ESR3XLUB0500	ESR3XLDB0500	500	1500	250 kA	1500	60000	843000	164	•
NH 3XL	ESR3XLUB0550	ESR3XLDB0550	550	1500	250 kA	1650	85000	1207000	164	•
NH 3XL	ESR3XLUB0630	ESR3XLDB0630	630	1500	250 kA	1890	124800	1402000	191	•

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### Dimensions

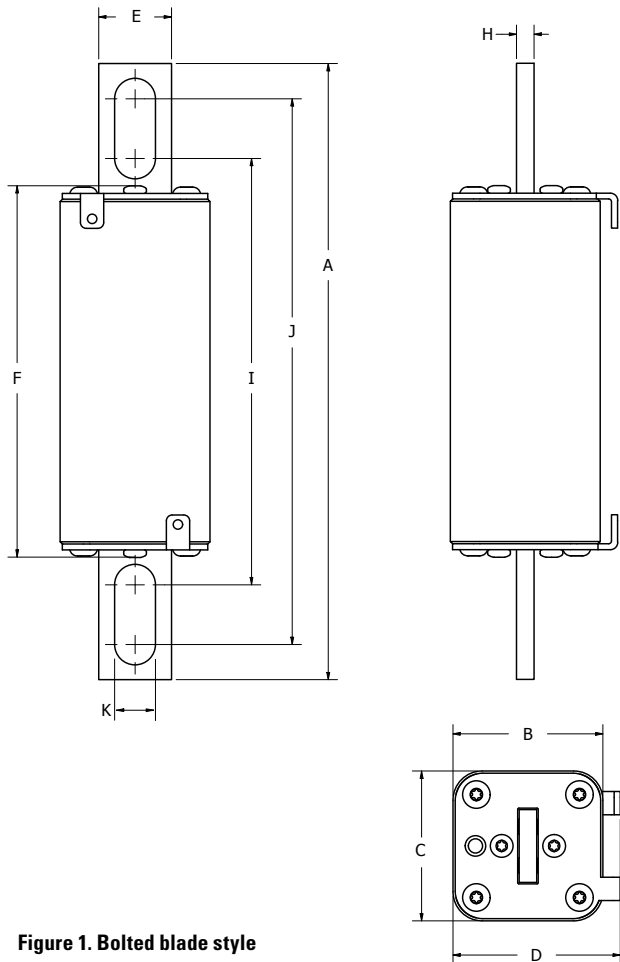


Figure 1. Bolted blade style

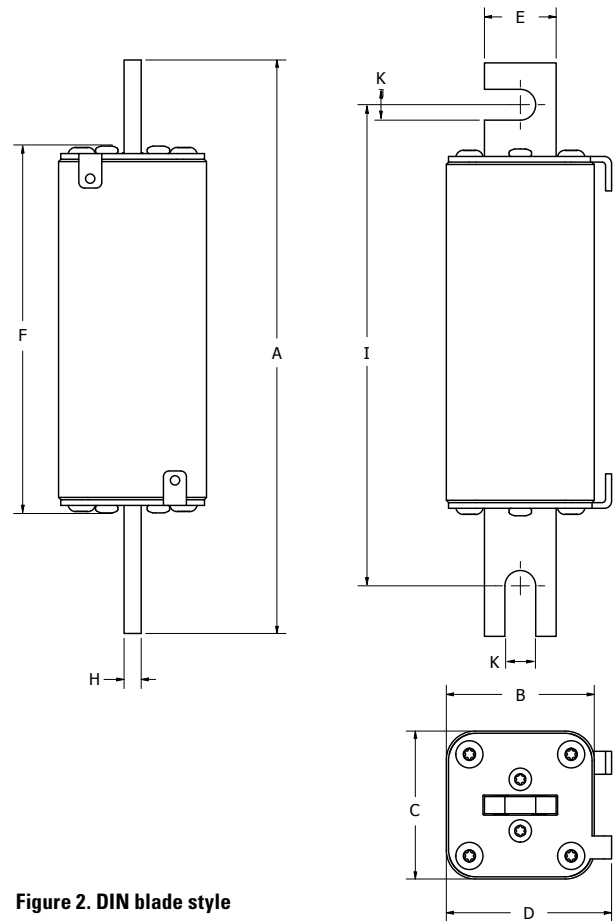


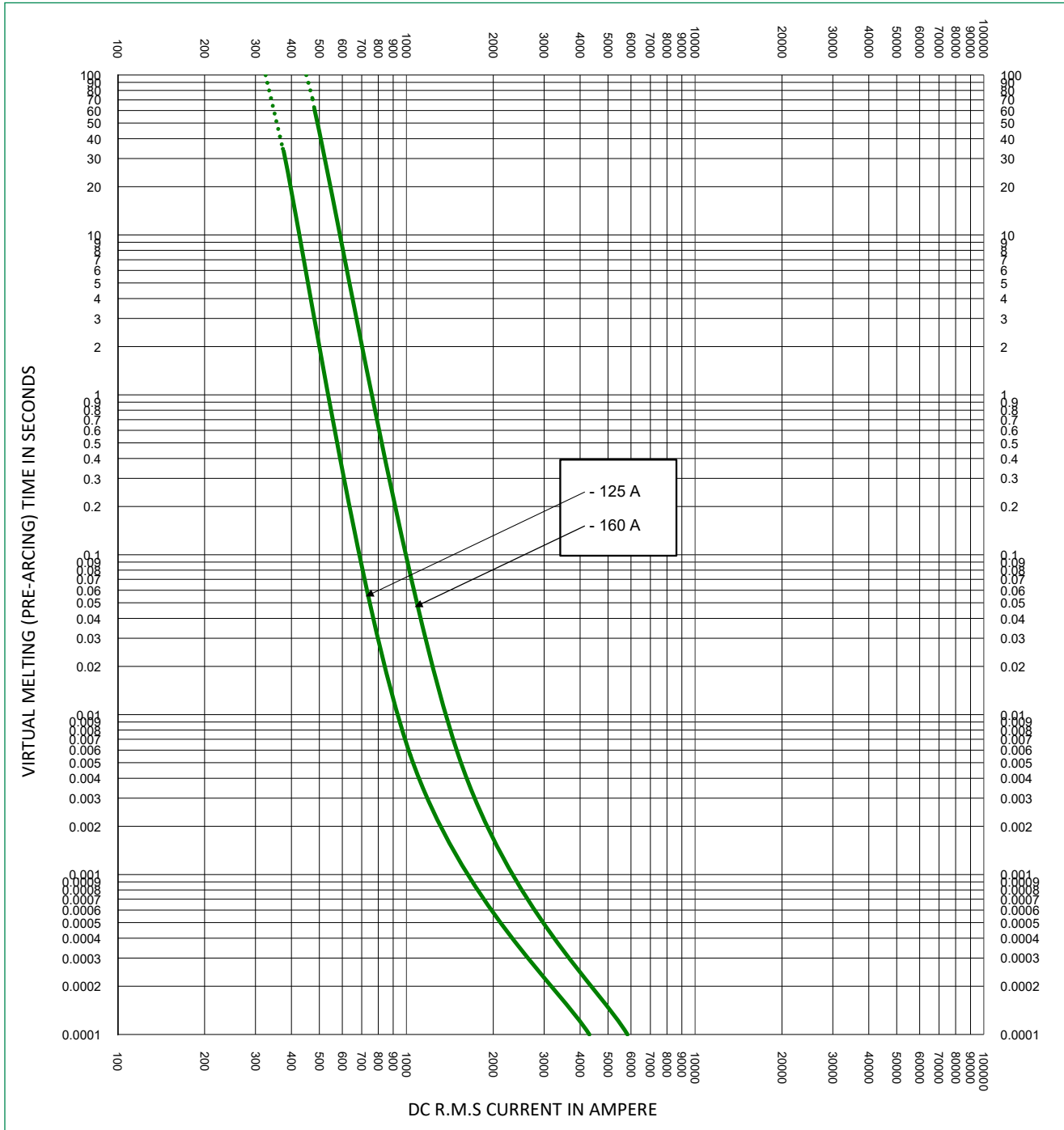
Figure 2. DIN blade style

DIMENSIONS MM (IN)														
CASE SIZE	MOUNTING STYLE	FIGURE	A	B	C	D	E	F	H	I	J	K	RECOMMENDED FASTENER	RECOMMENDED TORQUE
NH 1XL	BOLTED BLADE (UB)	1	211.7 (8.33)	51.5 (2.03)	51.5 (2.03)	57.5 (2.26)	25.0 (0.98)	127.7 (5.03)	6.0 (0.24)	146.5 (5.77)	187.5 (7.38)	14.0 (0.55)	12 (1/2)	64 Nm
NH 1XL	DIN BLADE (DB)	2	199.7 (7.86)	51.5 (2.03)	51.5 (2.03)	57.5 (2.26)	25.0 (0.98)	127.7 (5.03)	6.0 (0.24)	167.5 (6.59)	-	10.5-11.0 (0.41-0.43)	10 (3/8)	26 Nm
NH 3XL	BOLTED BLADE (UB)	1	213.9 (8.42)	73.5 (2.89)	73.5 (2.89)	79.5 (3.13)	36.0 (1.42)	128.7 (5.07)	6.0 (0.24)	153.5 (6.04)	186.5 (7.34)	16.0 (0.63)	14 (9/16)	92 Nm
NH 3XL	BOLTED BLADE (DB)	2	199.7 (7.86)	73.5 (2.89)	73.5 (2.89)	79.5 (3.13)	36.0 (1.42)	128.7 (5.07)	6.0 (0.24)	167.5 (6.59)	-	10.5-11.0 (0.41-0.43)	10 (3/8)	26 Nm

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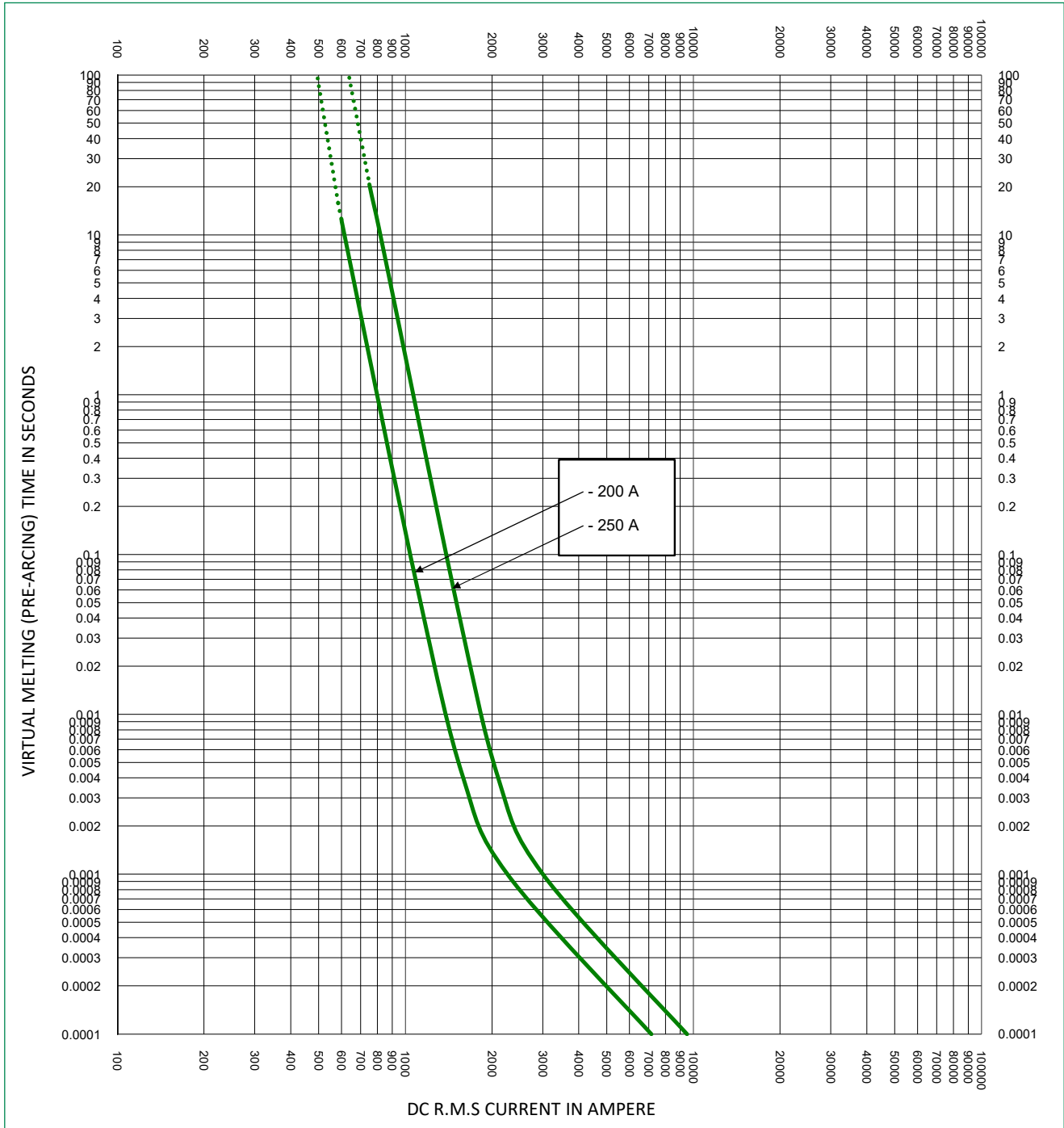
### Time Current Curve (1XL Case Size)



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## ESR Series High-Speed Square Body

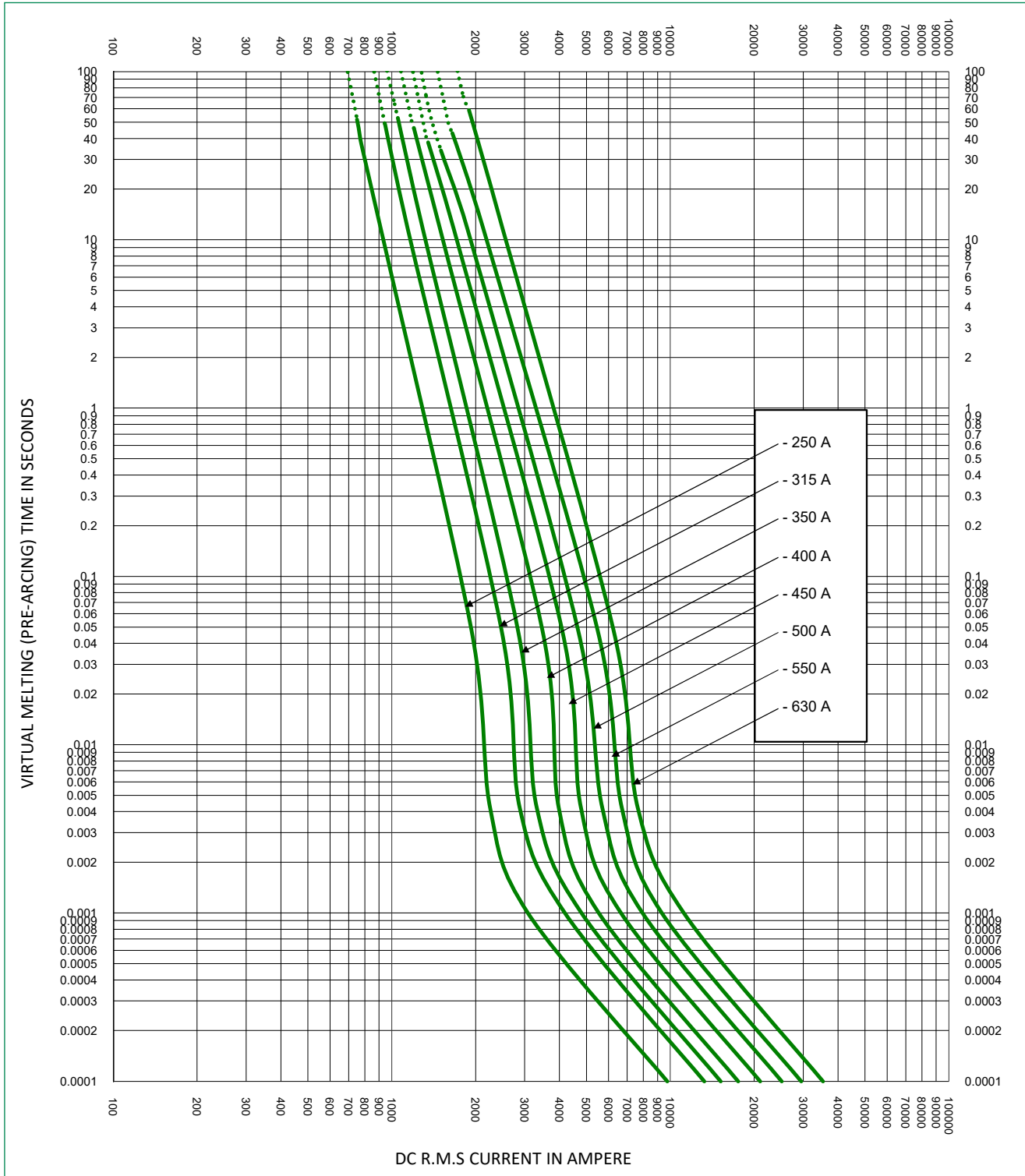
### Time Current Curve (1XL Case Size)



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## ESR Series High-Speed Square Body

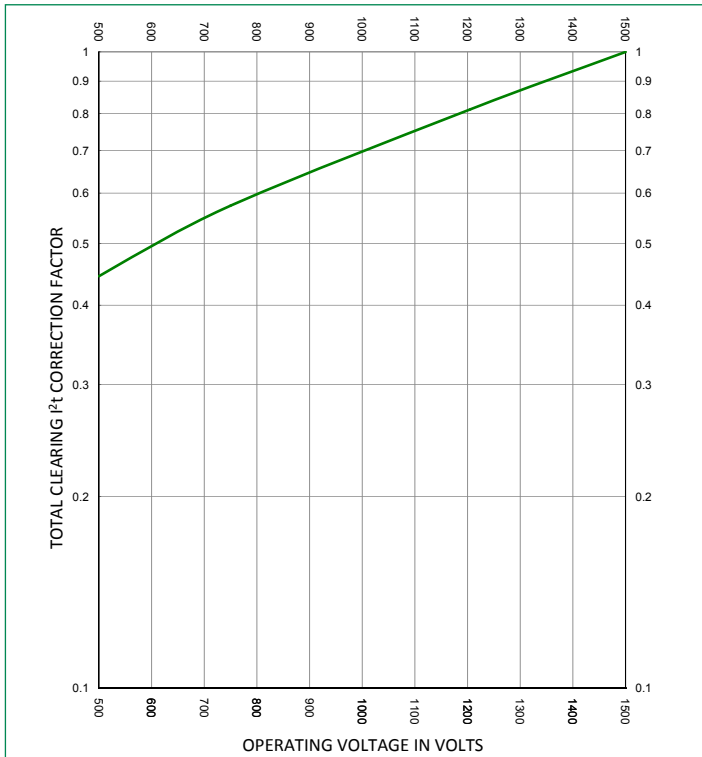
### Time Current Curve (3XL Case Size)



# POWR-SPEED® Fuse

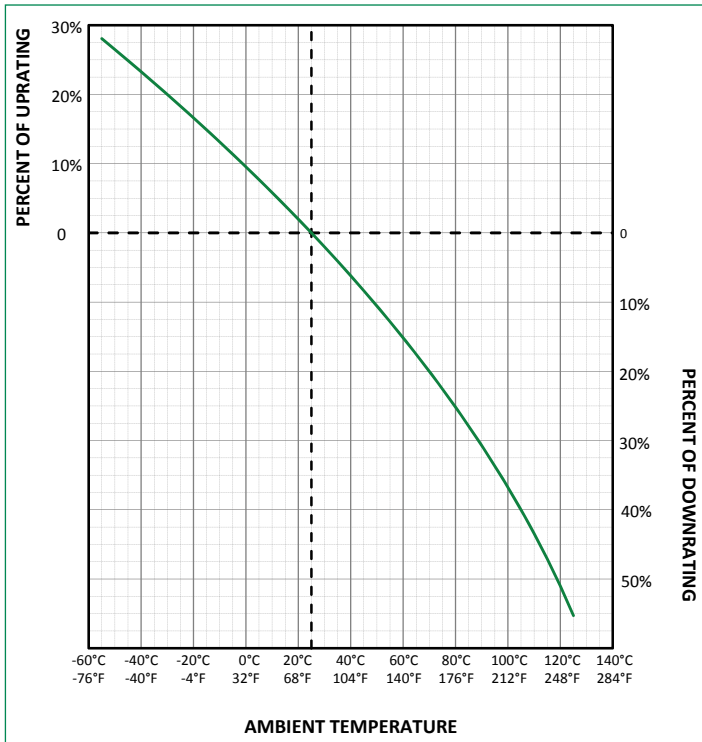
## ESR Series High-Speed Square Body

### Total Clearing I<sup>2</sup>T Correction Factor Curve (1XL and 3XL)



### Temperature Derating Curve

Ambient temperature: temperature of air immediately surrounding fuse

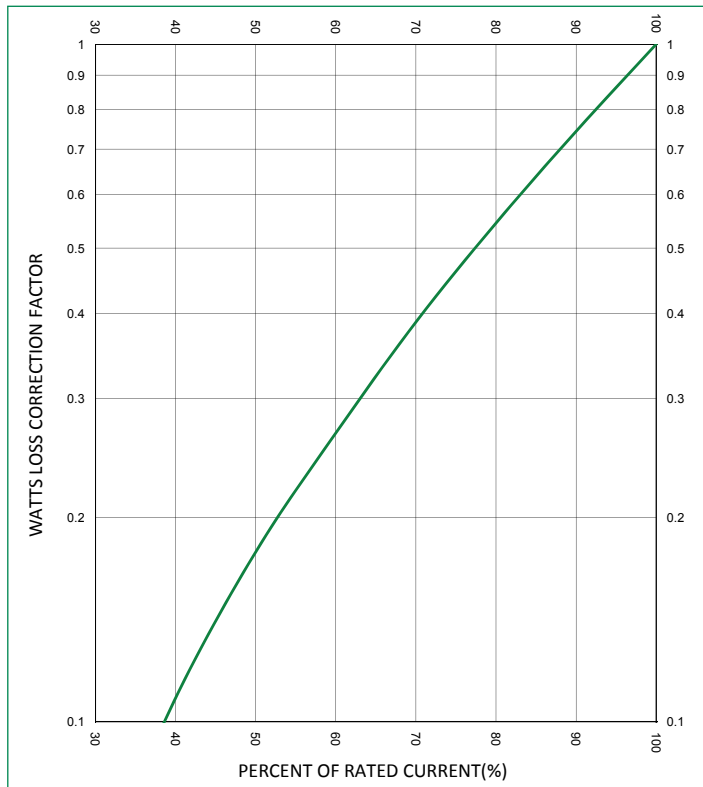




# POWR-SPEED® Fuse

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### Watts Loss Correction Factor Curve



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