

# Semiconductor & Special Protection

## Protistor® Cylindrical fuse-links

### 10x38 gR 690VAC from 1 to 32A

Data Sheet

The 10x38 gR cylindrical is a fast acting, full range fuse used in the protection of inverters, UPS, variable speed drives and other discrete semiconductor devices.

#### Benefits

- International 10x38 mm (1-1/2" x 13/32") for worldwide acceptance
- Extremely fast acting
- Eliminate all overloads
- Current limiting
- Low I<sup>2</sup>t for improved semiconductor protection
- Excellent cycling capability
- gR Class according to VDE 636-23 and IEC 60269-4

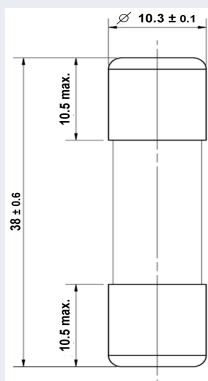
#### Applications

- Protection of small inverters, UPS systems, motor drives and similar 700V or less equipment.



Rated Voltage (V)	Nominal Current (A)	Class	Catalog Number	Reference Number
690	1	gR	FR10GR69V1	L1014563
690	1.25	gR	FR10GR69V1.25	N1014565
690	1.5	gR	FR10GR69V1.5	P1014566
690	2	gR	FR10GR69V2	Q1014567
690	2.5	gR	FR10GR69V2.5	T1014570
690	3	gR	FR10GR69V3	V1014571
690	4	gR	FR10GR69V4	W1014572
690	5	gR	FR10GR69V5	X1014573
690	6	gR	FR10GR69V6	Y1014574
690	8	gR	FR10GR69V8	Z1014575
690	10	gR	FR10GR69V10	A1014576
690	12.5	gR	FR10GR69V12.5	C1014578
690	16	gR	FR10GR69V16	D1014579
690	20	gR	FR10GR69V20	E1014580
690	25	gR	FR10GR69V25	F1014581
690	30	gR	FR10GR69V30	G1014582
690	32	gR	FR10GR69V32	H1014583

#### Dimensions (mm)



#### Ratings

- 690VAC IEC 60269-4 and 700VAC UL Recognized
- 500VDC UL Recognized

#### Approvals

- UL/CSA Recognized Component
- AC: UL Guide No. E76491
- IEC 60269-4 Compliance
- RoHS Compliant



#### Related products

Fuse-holders: Modulostar® CMS10

Product weight: 10g max.

Packaging: 10 pieces

# Semiconductor & Special Protection

## Protistor® Cylindrical fuse-links

### 10x38 gR 690VAC from 1 to 32A



#### 10x38 gR fuse-links

Rated Voltage (V)	Nominal Current (A)	Breaking Capacity @ Rated Voltage (kA)	Pre-arcing I <sup>2</sup> t (A <sup>2</sup> s)	Clearing I <sup>2</sup> t @ Rated Voltage (A <sup>2</sup> s)	Watts Loss @ 100% In (W)	Watts Loss @ 80% In (W)
690	1	160	0.17	0.48	0.8	0.4
690	1.25	160	0.18	0.55	1.5	0.8
690	1.5	160	0.31	0.80	1.2	0.6
690	2	160	0.94	2.5	1.3	0.7
690	2.5	160	1.65	4.5	1.4	0.8
690	3	160	2.83	7.8	1.5	0.9
690	4	160	6.7	12	1.7	1.0
690	5	160	7.5	30	0.9	0.6
690	6	160	8.5	40	1.4	0.8
690	8	160	5.4	35	1.9	1.1
690	10	160	6.7	55	2.1	1.2
690	12.5	160	11	90	2.8	1.3
690	16	160	19	140	3.0	1.7
690	20	160	39	245	3.7	2.1
690	25	160	69	425	4.3	2.4
690	30	160	107	675	4.8	2.7
690	32	160	154	945	5.1	2.8

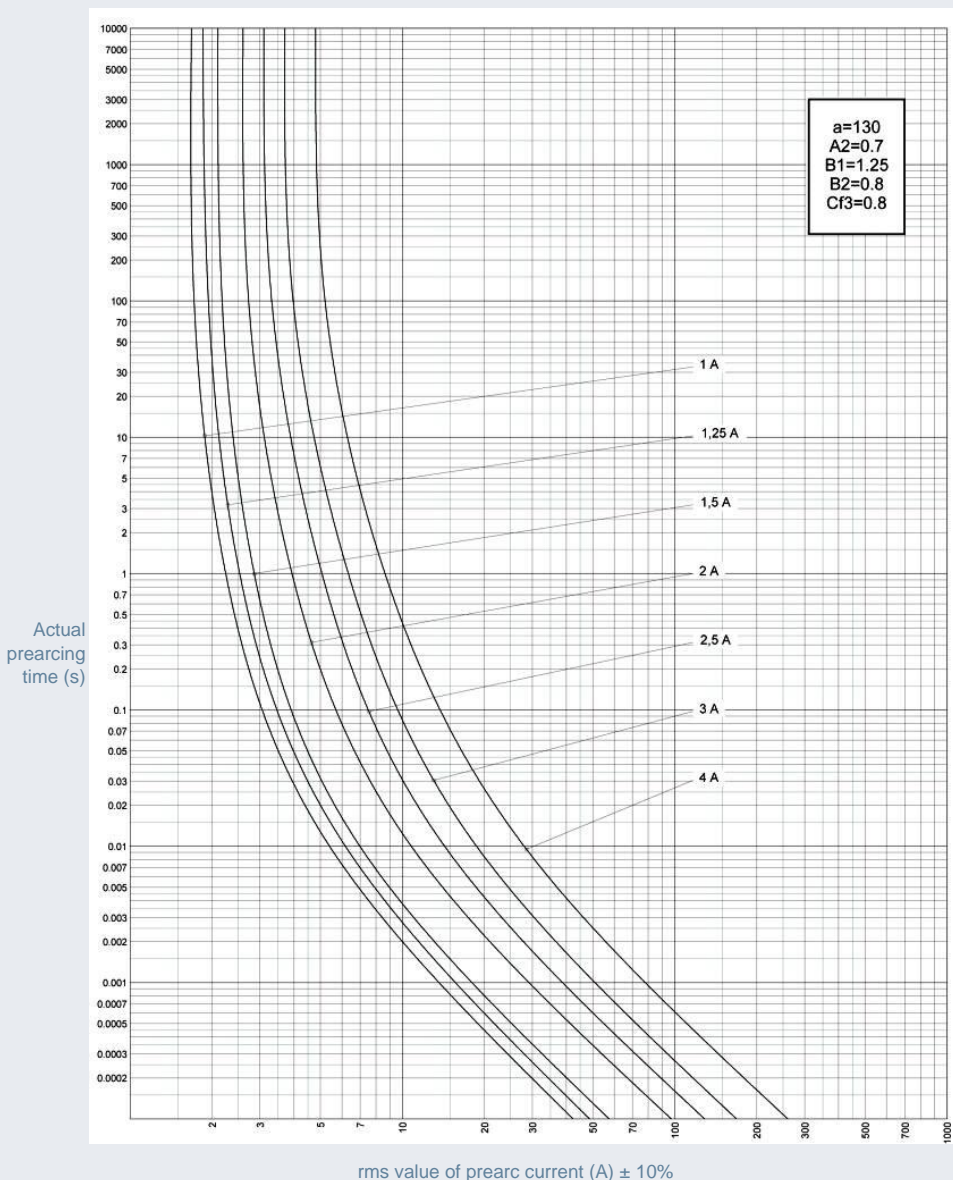
# Semiconductor & Special Protection

## Protistor® Cylindrical fuse-links

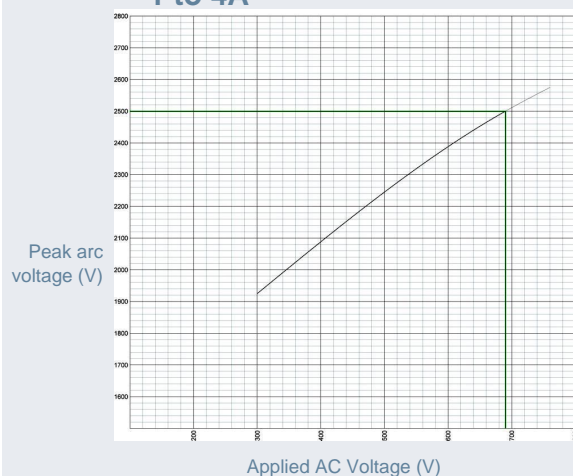
10x38 gR 690VAC from 1 to 32A



Time current characteristics  
1 to 4A



Peak arc voltage  
1 to 4A



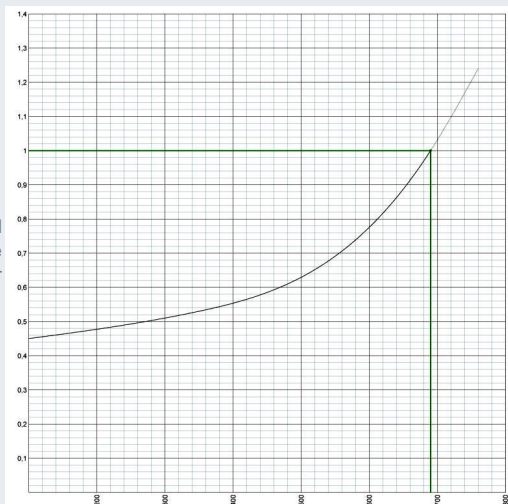
# Semiconductor & Special Protection

## Protistor® Cylindrical fuse-links

### 10x38 gR 690VAC from 1 to 32A



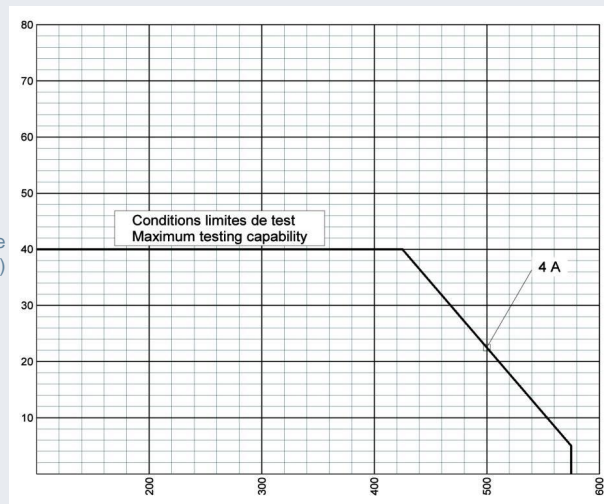
**I<sup>2</sup>t multiplier coefficient  
1 to 4A**



Applied AC voltage (V)

Clearing I<sup>2</sup>t and arcing time correction factor

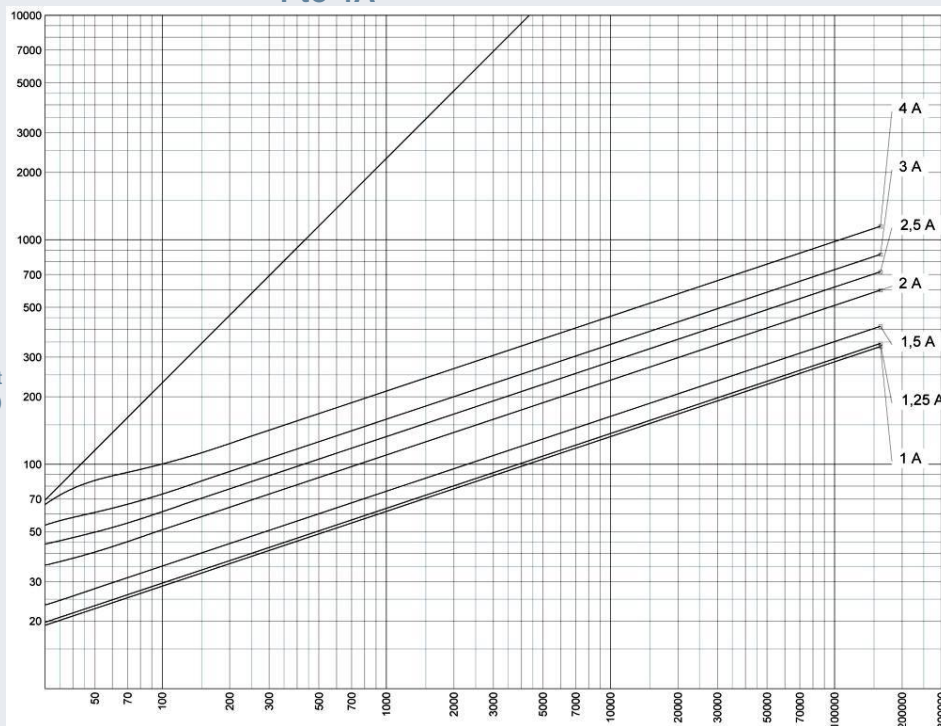
**L/R time constant vs DC voltage capability  
1 to 4A**



DC voltage capability (V)

L/R time constant (ms)

**Peak let thru characteristics  
1 to 4A**



50 Hz rms symmetrical prospective current (Ip) (A)

Maximum peak let thru current (A)

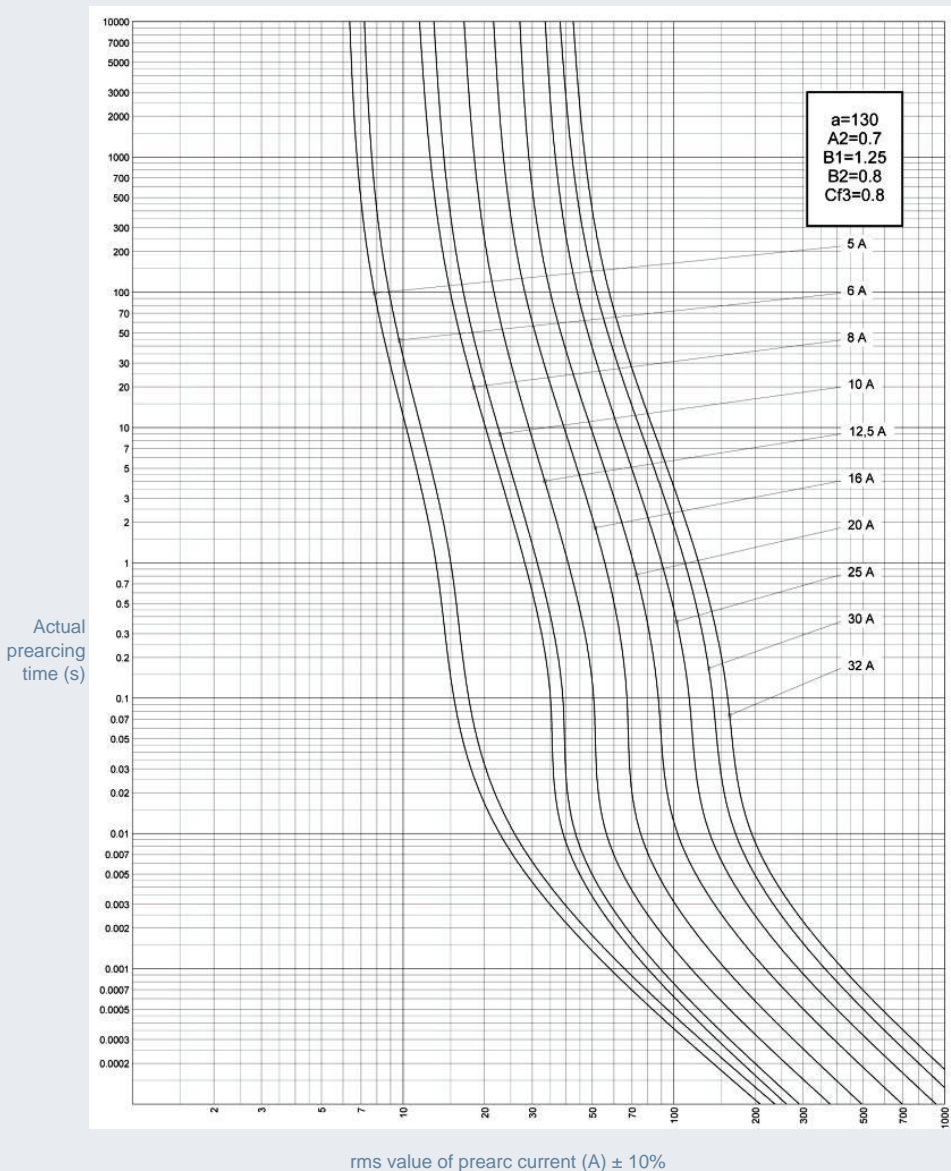
# Semiconductor & Special Protection

## Protistor® Cylindrical fuse-links

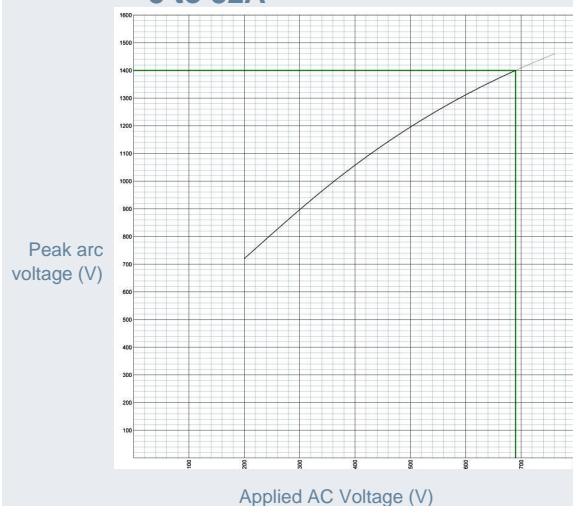
10x38 gR 690VAC from 1 to 32A



### Time current characteristics 5 to 32A



### Peak arc voltage 5 to 32A



# Semiconductor & Special Protection

## Protistor® Cylindrical fuse-links

### 10x38 gR 690VAC from 1 to 32A



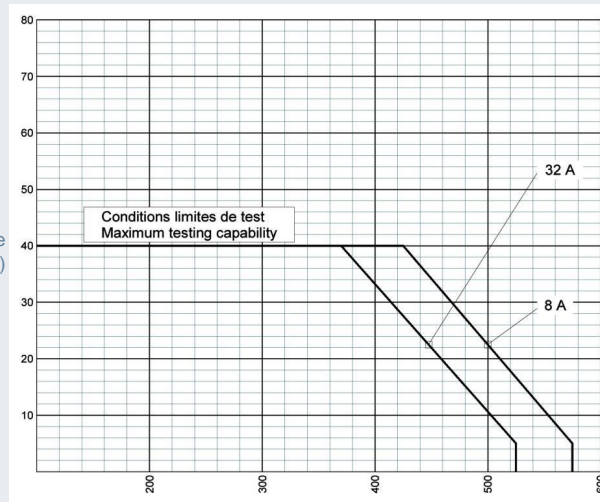
**I<sup>2</sup>t multiplier coefficient  
5 to 32A**



Clearing I<sup>2</sup>t and arcing time correction factor

Applied AC voltage (V)

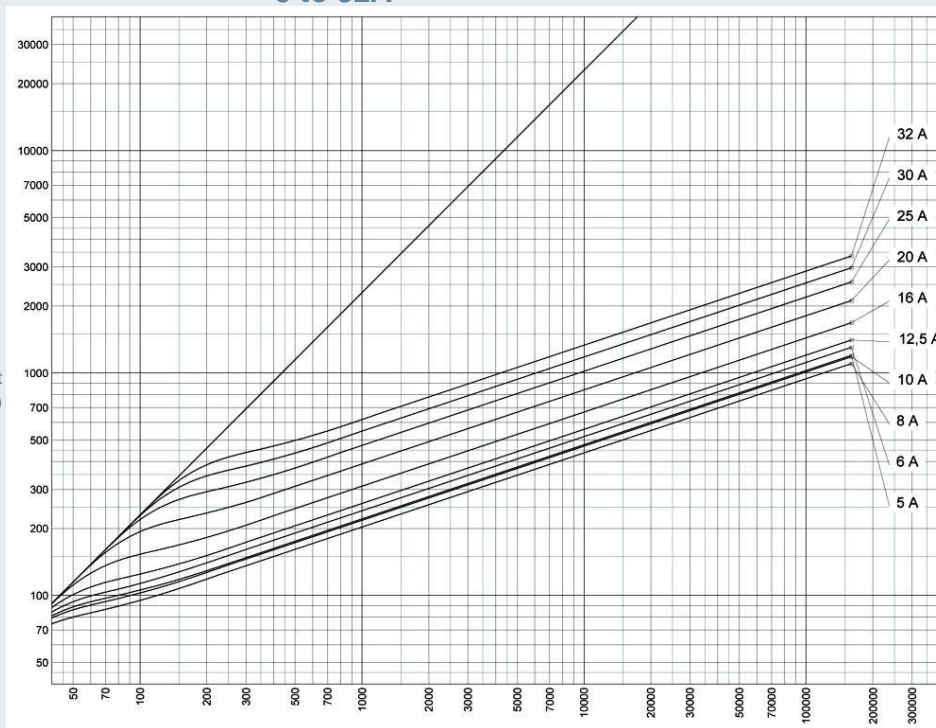
**L/R time constant vs DC voltage capability  
5 to 32A**



L/R time constant (ms)

DC voltage capability (V)

**Peak let thru characteristics  
5 to 32A**



Maximum peak let thru current (A)

50 Hz rms symmetrical prospective current (Ip) (A)

# Protistor® size 14x51 gR

690VAC (IEC) / 700VAC (UL)

## SEMICONDUCTOR PROTECTION FUSES

### IEC HIGH-SPEED CYLINDRICAL FUSE-LINKS AC PROTECTION



These Protistor® size 14x51 have been designed to protect power semi conductors, complying with standard IEC 60269-1 and -4. They are extremely high interrupting rating fuses: 690VAC, with large band of ratings (current rating 1 to 63A).

Two models are existing: with or without trip-indicator.

## TECHNICAL DATA OVERVIEW

Rated voltage AC (IEC)	690 V
Ampere Range (A)	1 ... 63 A
Size per Standard	14x51
Speed/Characteristic	gR
I.R. AC (IEC)	160 kA
I.R. AC (UL)	200 kA
I.R. DC (UL)	50 kA
Rated voltage AC (UL)	700 V
Rated voltage DC (UL)	500 V

## FEATURES & BENEFITS

- IEC standard 60269-4 compliant
- UL 248-13 compliant
- gR class
- Clearing all overloads
- Improved safety and protection
- Enabling selective coordination among all
- Distribution circuit fuses
- With or without trip-indicator

## STANDARDS

- IEC 60269-4
- UL Recognized
- UL 248-13
- CCC GB 1539.4
- RoHS compliant



# Protistor® size 14x51 gR

690VAC (IEC) / 700VAC (UL)

## PRODUCT RANGE



FR14GR69V16T

### CP 14x51 gR with striker

Catalog number	Item number	Rated voltage AC (IEC)	Rated current I <sub>n</sub>	Clearing I <sup>2</sup> t at Rated Voltage	Rated breaking capacity AC	Power dissipation at I <sub>n</sub>	Pre-arcing I <sup>2</sup> t	Package	Weight
FR14GR69V2T	D1017178	690 V	2 A	1.8 A <sup>2</sup> s	160 kA	1.75 W	0.9 A <sup>2</sup> s	10	20 g
FR14GR69V4T	E1017179	690 V	4 A	13 A <sup>2</sup> s	160 kA	2.9 W	6.7 A <sup>2</sup> s	10	20 g
FR14GR69V6T	F1017180	690 V	6 A	35 A <sup>2</sup> s	160 kA	2 W	8 A <sup>2</sup> s	10	20 g
FR14GR69V8T	G1017181	690 V	8 A	40 A <sup>2</sup> s	160 kA	2.25 W	4.3 A <sup>2</sup> s	10	20 g
FR14GR69V10T	H1017182	690 V	10 A	45 A <sup>2</sup> s	160 kA	2.95 W	4.3 A <sup>2</sup> s	10	20 g
FR14GR69V12T	J1017183	690 V	12 A	60 A <sup>2</sup> s	160 kA	4.1 W	5.4 A <sup>2</sup> s	10	20 g
FR14GR69V16T	K1017184	690 V	16 A	125 A <sup>2</sup> s	160 kA	4.65 W	13.1 A <sup>2</sup> s	10	20 g
FR14GR69V20T	L1017185	690 V	20 A	230 A <sup>2</sup> s	160 kA	4.8 W	26.8 A <sup>2</sup> s	10	20 g
FR14GR69V25T	M1017186	690 V	25 A	385 A <sup>2</sup> s	160 kA	5.95 W	52.5 A <sup>2</sup> s	10	20 g
FR14GR69V32T	Q1017189	690 V	32 A	700 A <sup>2</sup> s	160 kA	6.9 W	96.7 A <sup>2</sup> s	10	20 g
FR14GR69V40T	S1017191	690 V	40 A	1050 A <sup>2</sup> s	160 kA	7.5 W	210 A <sup>2</sup> s	10	20 g
FR14GR69V50T	T1017192	690 V	50 A	2250 A <sup>2</sup> s	160 kA	8.75 W	387 A <sup>2</sup> s	10	20 g
FR14GR69V63T	V1017193	690 V	63 A	2900 A <sup>2</sup> s	160 kA	12.5 W	617 A <sup>2</sup> s	10	20 g



FR14GR69V63

### CP 14x51 gR without striker

Catalog number	Item number	Rated voltage AC (IEC)	Rated current I <sub>n</sub>	Clearing I <sup>2</sup> t at Rated Voltage	Rated breaking capacity AC	Power dissipation at I <sub>n</sub>	Pre-arcing I <sup>2</sup> t	Package	Weight
FR14GR69V1	X1017195	690 V	1 A	0.3 A <sup>2</sup> s	160 kA	1.15 W	0.2 A <sup>2</sup> s	10	20 g
FR14GR69V2	Y1017196	690 V	2 A	1.8 A <sup>2</sup> s	160 kA	1.75 W	0.9 A <sup>2</sup> s	10	20 g
FR14GR69V4	Z1017197	690 V	4 A	13 A <sup>2</sup> s	160 kA	2.9 W	6.7 A <sup>2</sup> s	10	20 g
FR14GR69V6	A1017198	690 V	6 A	35 A <sup>2</sup> s	160 kA	2 W	8 A <sup>2</sup> s	10	20 g
FR14GR69V8	B1017199	690 V	8 A	40 A <sup>2</sup> s	160 kA	2.25 W	4.3 A <sup>2</sup> s	10	20 g
FR14GR69V10	C1017200	690 V	10 A	45 A <sup>2</sup> s	160 kA	2.95 W	4.3 A <sup>2</sup> s	10	20 g
FR14GR69V12	D1017201	690 V	12 A	60 A <sup>2</sup> s	160 kA	4.1 W	5.4 A <sup>2</sup> s	10	20 g
FR14GR69V16	E1017202	690 V	16 A	125 A <sup>2</sup> s	160 kA	4.65 W	13.1 A <sup>2</sup> s	10	20 g
FR14GR69V20	F1017203	690 V	20 A	230 A <sup>2</sup> s	160 kA	4.8 W	26.8 A <sup>2</sup> s	10	20 g
FR14GR69V25	G1017204	690 V	25 A	385 A <sup>2</sup> s	160 kA	5.95 W	52.5 A <sup>2</sup> s	10	20 g
FR14GR69V32	H1017205	690 V	32 A	700 A <sup>2</sup> s	160 kA	6.9 W	96.7 A <sup>2</sup> s	10	20 g
FR14GR69V40	J1017206	690 V	40 A	1050 A <sup>2</sup> s	160 kA	7.5 W	210 A <sup>2</sup> s	10	20 g
FR14GR69V50	K1017207	690 V	50 A	2250 A <sup>2</sup> s	160 kA	8.75 W	387 A <sup>2</sup> s	10	20 g
FR14GR69V63	L1017208	690 V	63 A	2900 A <sup>2</sup> s	160 kA	12.5 W	617 A <sup>2</sup> s	10	20 g

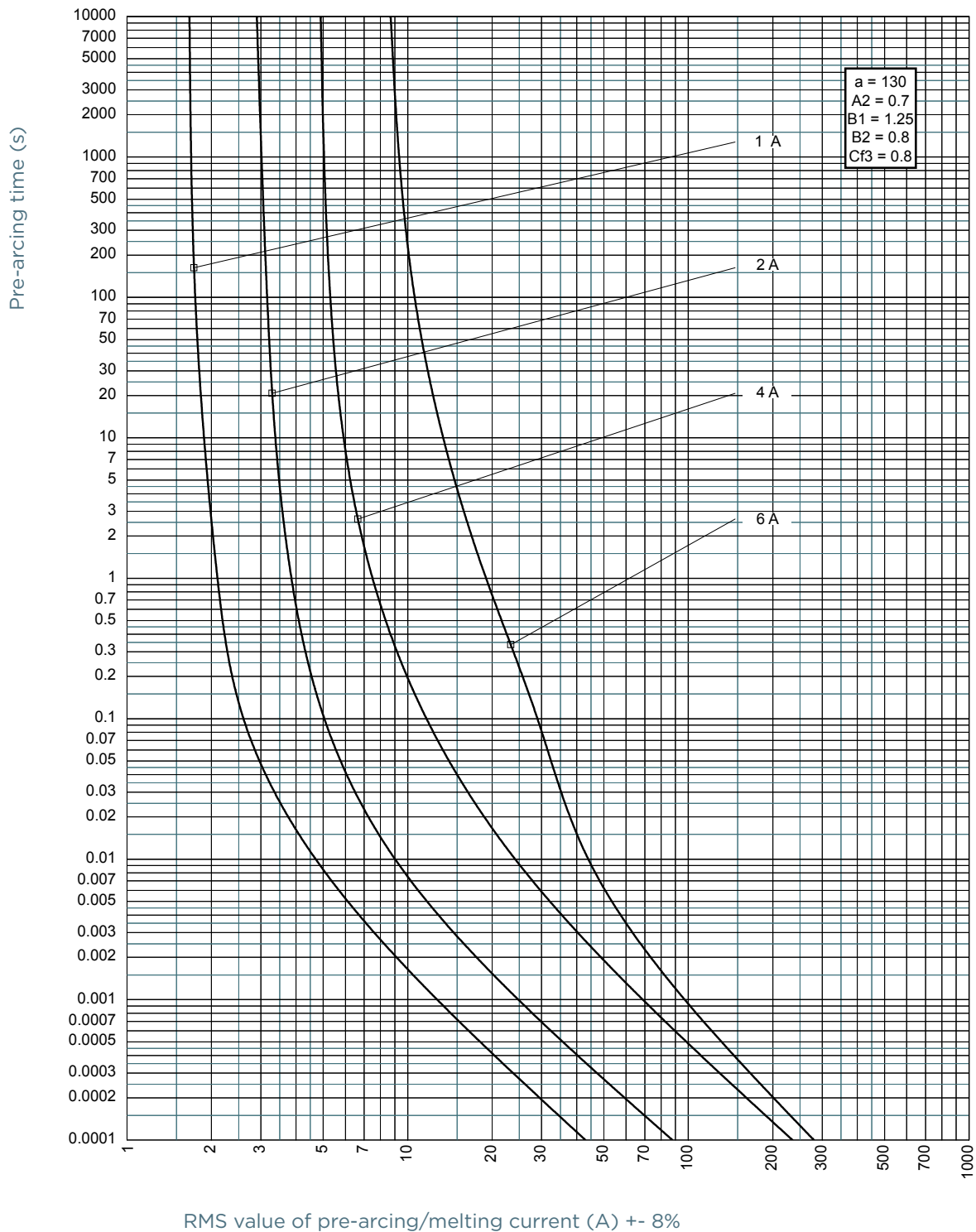


# Protistor® size 14x51 gR

690VAC (IEC) / 700VAC (UL)

## TIME CURRENT CHARACTERISTIC CURVES

### Size 14x51 gR 1-6A



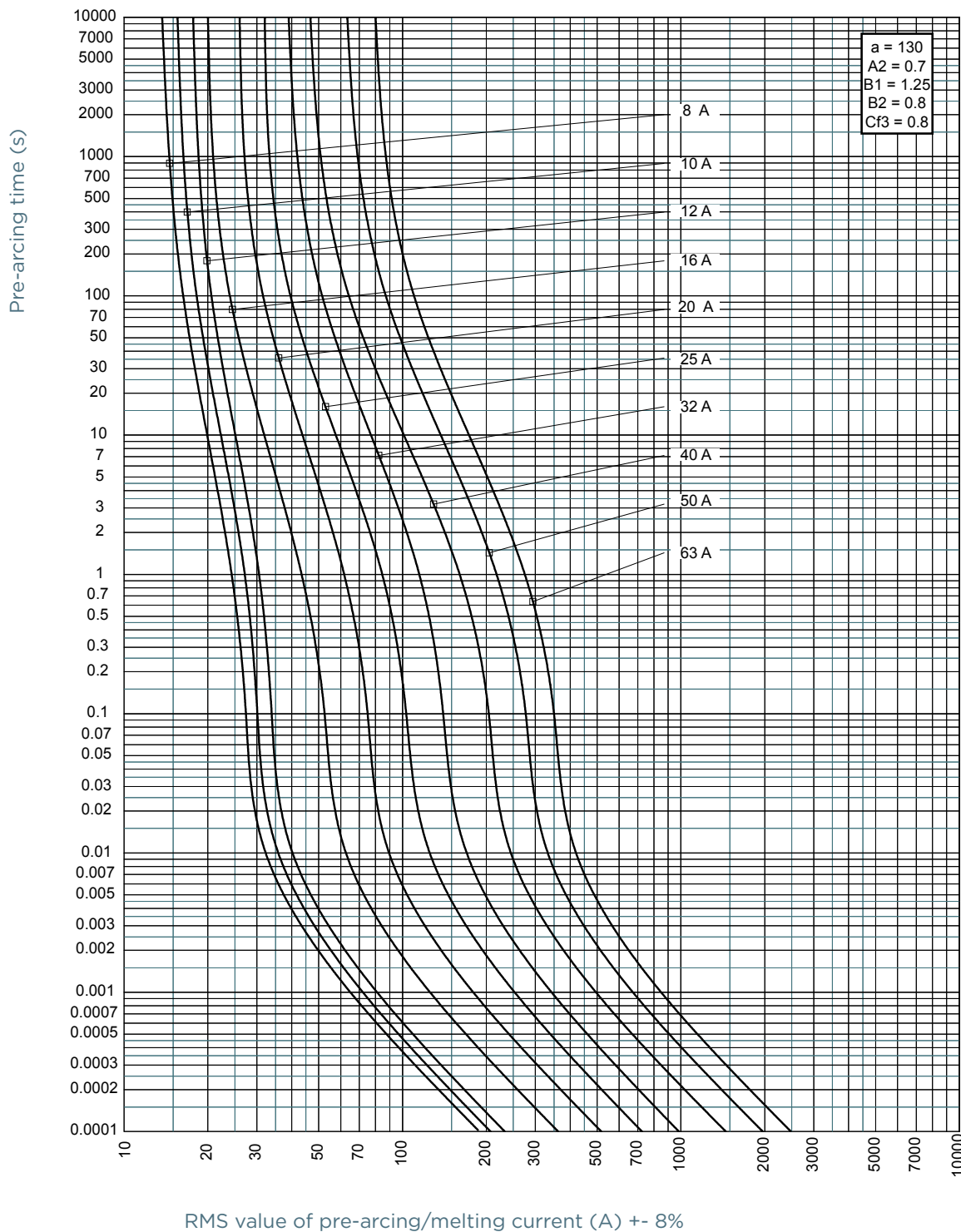
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# Protistor® size 14x51 gR

690VAC (IEC) / 700VAC (UL)

## TIME CURRENT CHARACTERISTIC CURVES

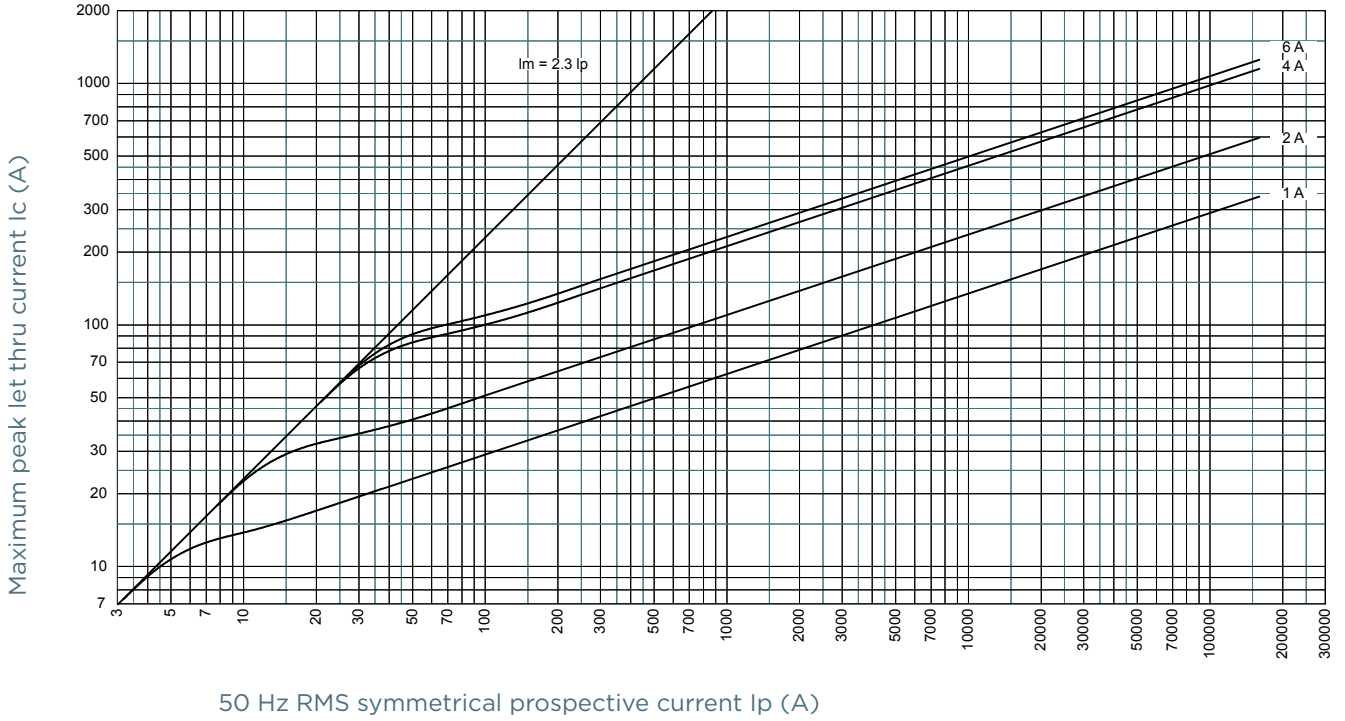
### Size 14x51 gR 8-63A



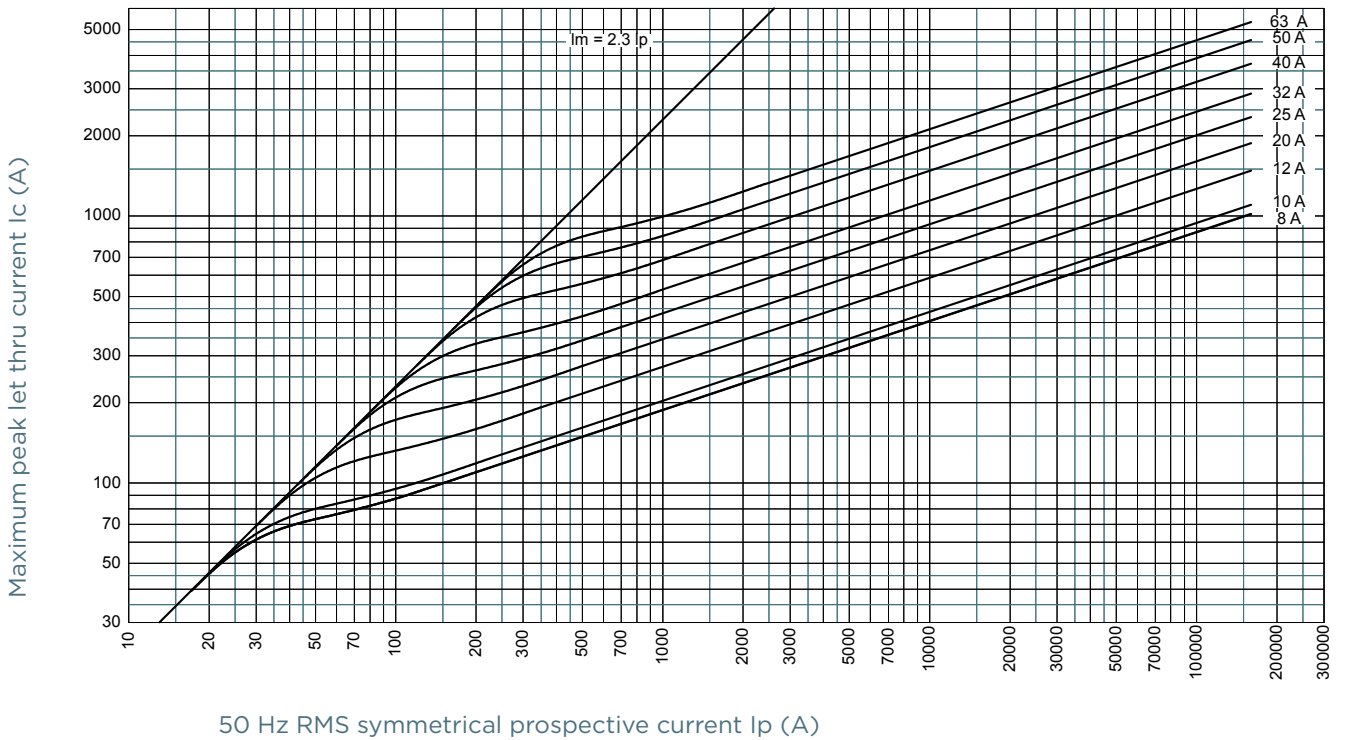
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CUT-OFF CURRENT CHARACTERISTIC

Size 14x51 gR 1-6A



Size 14x51 gR 8-63A

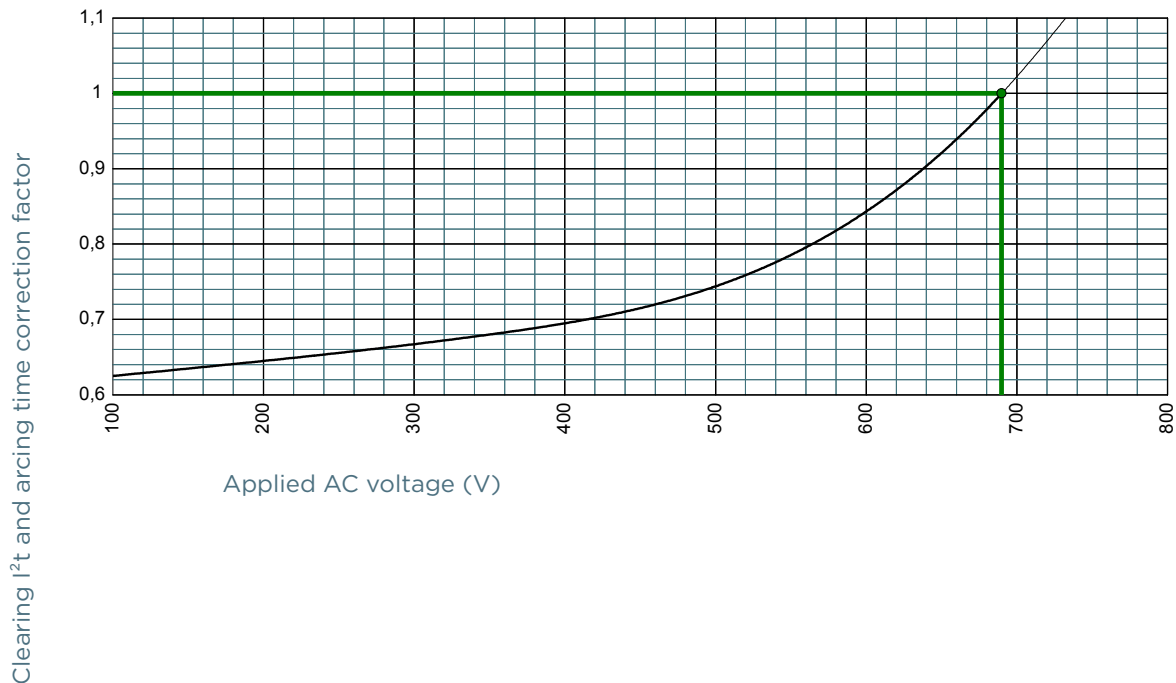


# Protistor® size 14x51 gR

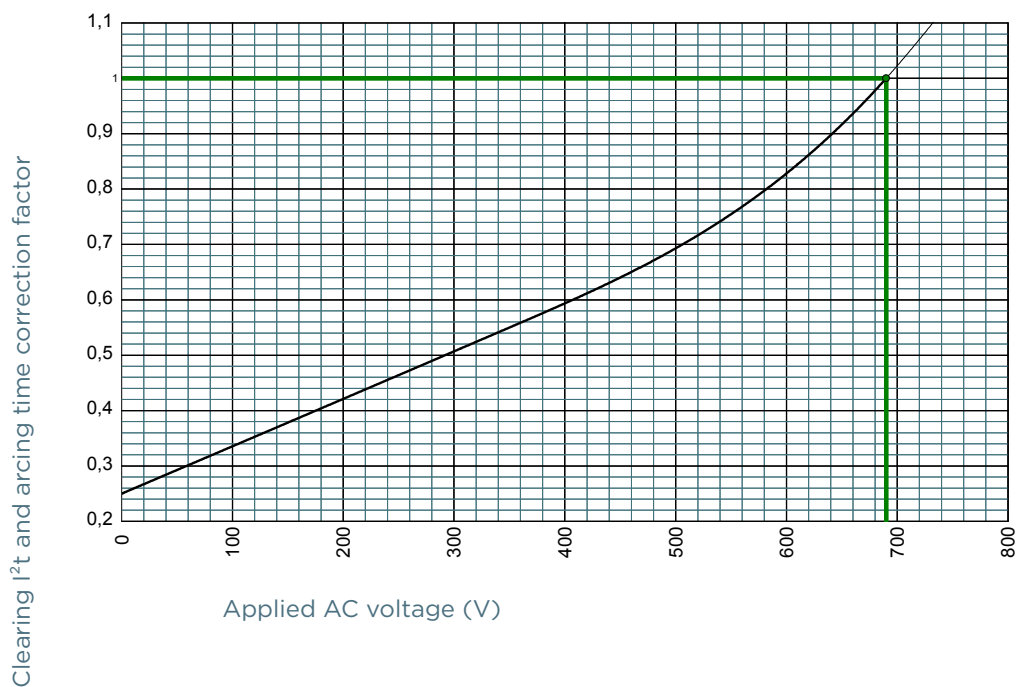
690VAC (IEC) / 700VAC (UL)

## I<sup>2</sup>T MULTIPLIER COEFFICIENT

### Size 14x51 gR 1-6A



### Size 14x51 gR 8-63A



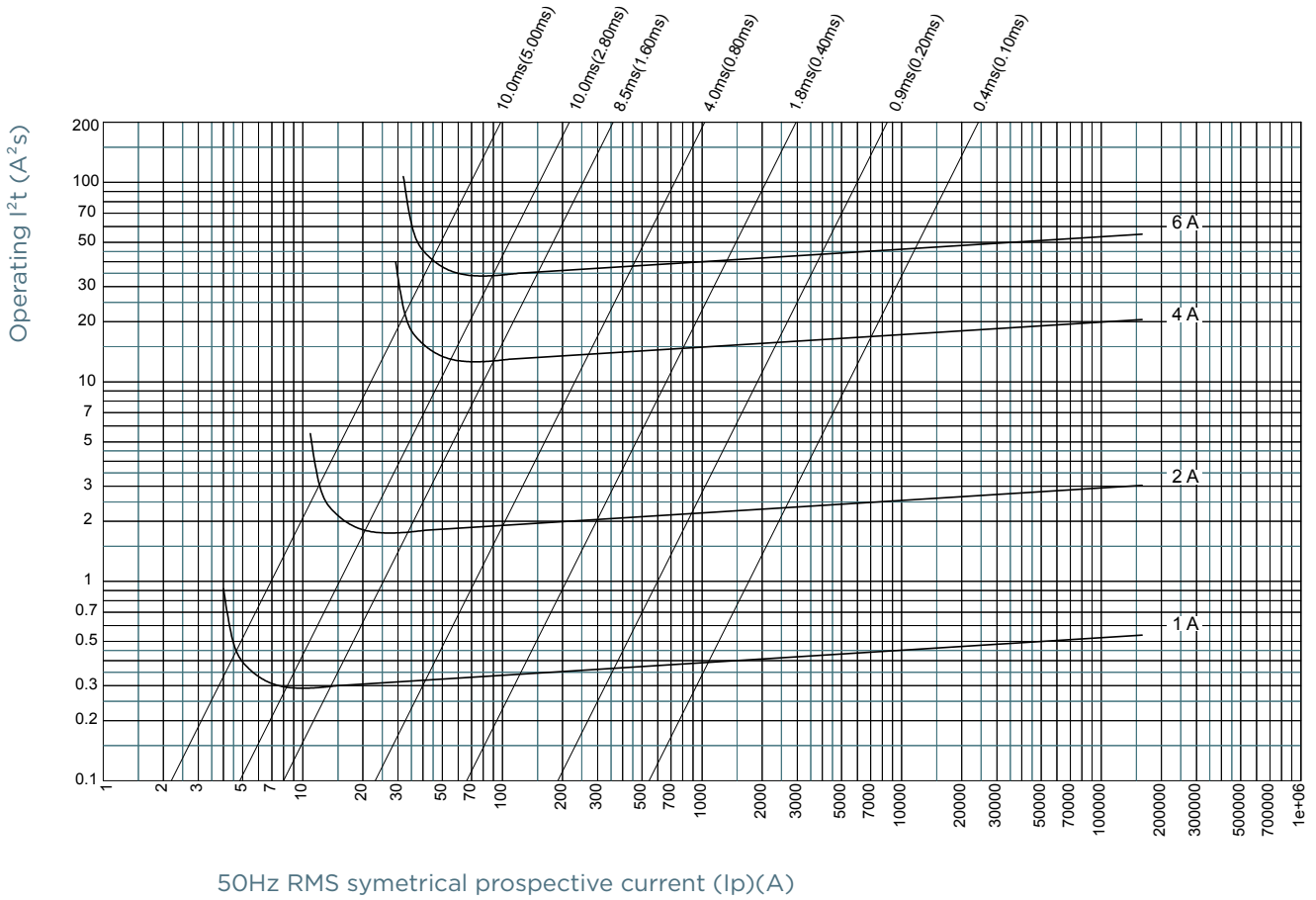
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# Protistor® size 14x51 gR

690VAC (IEC) / 700VAC (UL)

## CHARACTERISTICS TOTAL I<sup>2</sup>T CURVE

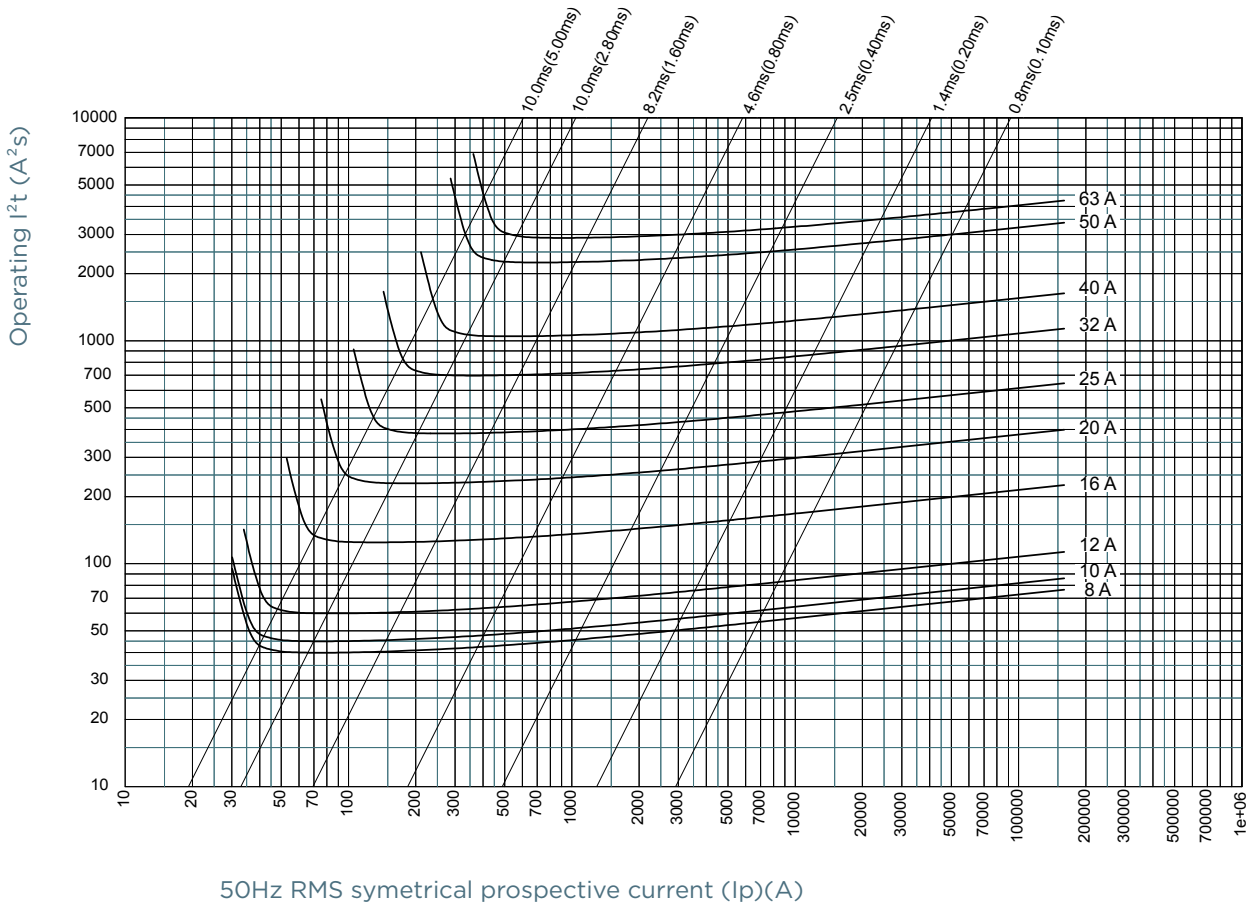
Size 14x51 gR 1-6A



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CHARACTERISTICS TOTAL I<sup>2</sup>T CURVE

Size 14x51 gR 8-63A



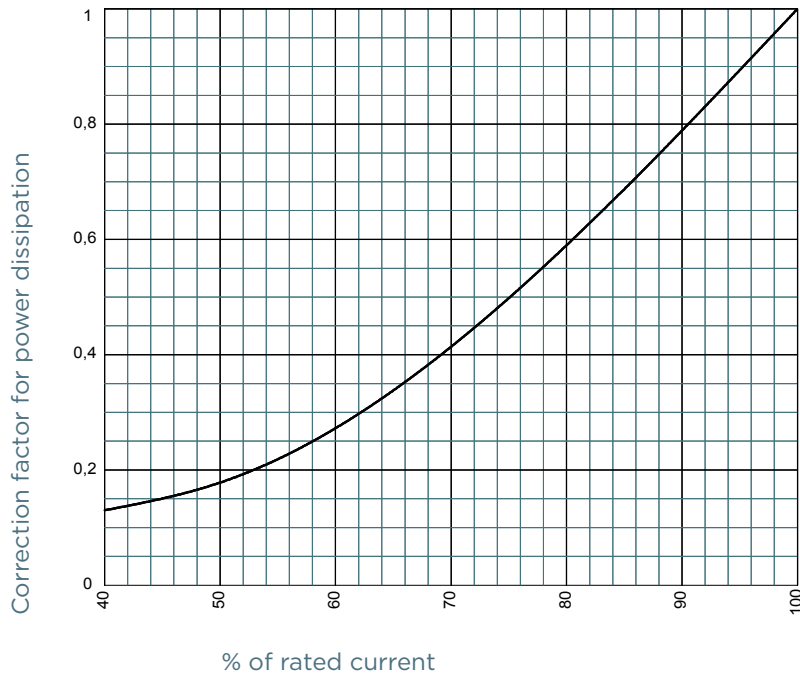
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# Protistor® size 14x51 gR

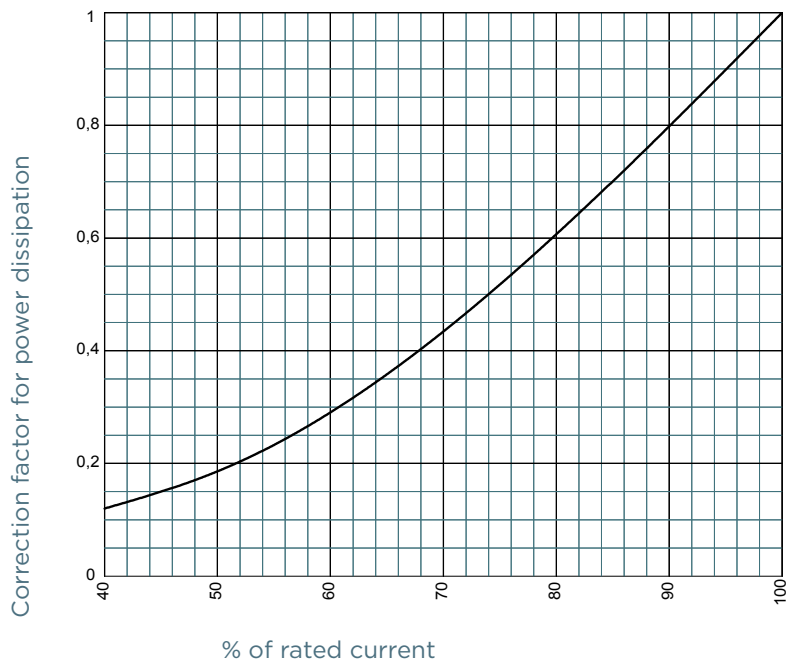
690VAC (IEC) / 700VAC (UL)

## POWER DISSIPATION

### Size 14x51 gR 1-6A



### Size 14x51 gR 8-63A



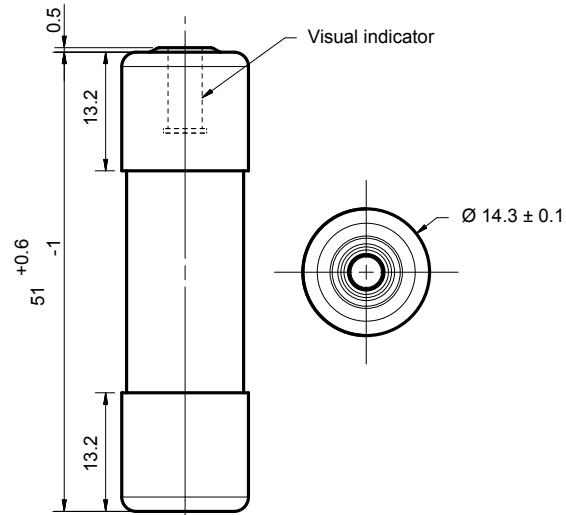
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# Protistor® size 14x51 gR

690VAC (IEC) / 700VAC (UL)

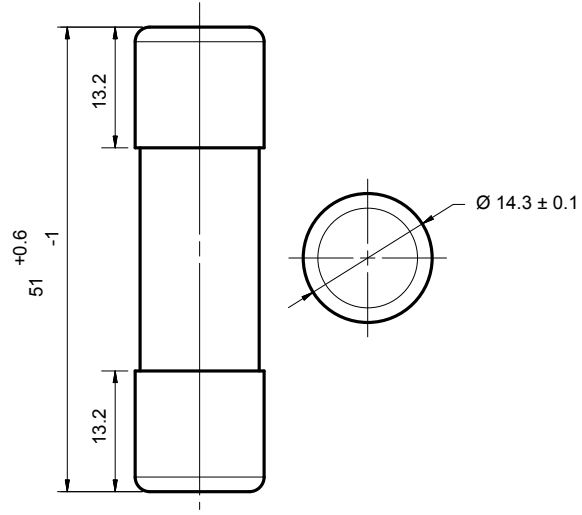
## DIMENSIONS

**CP 14x51 gR with striker** (100211)



Dimensions in mm

**CP 14x51 gR without striker** (100212)



Dimensions in mm



# Protistor® size 22x58 gR

690VAC (IEC) / 700VAC (UL)

## SEMICONDUCTOR PROTECTION FUSES

### IEC HIGH-SPEED CYLINDRICAL FUSE-LINKS AC PROTECTION



These Protistor® size 22x58 have been designed to protect power semiconductors, complying with standard IEC 60269-1 and -4.

They are extremely high interrupting rating fuses: 690 VAC, with large band of ratings (current rating 15 to 135 A).

Two models are existing: with or without trip-indicator

## TECHNICAL DATA OVERVIEW

Ampere Range (A)	12 ... 135 A
Size per Standard	22x58
Speed/Characteristic	gR
I.R. AC (IEC)	160 kA
I.R. AC (UL)	200 kA
I.R. DC (UL)	50 kA
Rated voltage AC (IEC)	690 V
Rated voltage AC (UL)	700 V
Rated voltage DC (UL)	500 V

## FEATURES & BENEFITS

- IEC standard 60269-4 compliant
- UL 248-13 compliant
- gR class
- Clearing all overloads
- Improved safety and protection
- Enabling selective coordination among all
- Distribution circuit fuses
- With or without trip-indicator

## STANDARDS

- IEC 60269-4
- UL recognized
- UL 248-13
- CCC GB 1539.4
- RoHS compliant



# Protistor® size 22x58 gR

690VAC (IEC) / 700VAC (UL)

## PRODUCT RANGE

### CP 22x58 gR with striker

Catalog number	Item number	Rated voltage AC (IEC)	Rated current I <sub>n</sub>	Pre-arcing I <sup>2</sup> t	Clearing I <sup>2</sup> t at Rated Voltage	Power dissipation at I <sub>n</sub>	Package	Weight
FR22GR69V12T	W1018620	690 V	12 A	5.4 A <sup>2</sup> s	60 A <sup>2</sup> s	4.4 W	10	60 g
FR22GR69V16T	X1018621	690 V	16 A	13.1 A <sup>2</sup> s	125 A <sup>2</sup> s	4.65 W	10	60 g
FR22GR69V20T	Y1018622	690 V	20 A	17.1 A <sup>2</sup> s	160 A <sup>2</sup> s	7 W	10	60 g
FR22GR69V25T	Z1018623	690 V	25 A	38.6 A <sup>2</sup> s	315 A <sup>2</sup> s	7.65 W	10	60 g
FR22GR69V32T	A1018624	690 V	32 A	77.4 A <sup>2</sup> s	670 A <sup>2</sup> s	9.1 W	10	60 g
FR22GR69V40T	B1018625	690 V	40 A	154 A <sup>2</sup> s	1050 A <sup>2</sup> s	9.5 W	10	60 g
FR22GR69V50T	C1018626	690 V	50 A	292 A <sup>2</sup> s	2050 A <sup>2</sup> s	11.8 W	10	60 g
FR22GR69V63T	D1018627	690 V	63 A	519 A <sup>2</sup> s	3350 A <sup>2</sup> s	13.6 W	10	60 g
FR22GR69V80T	E1018628	690 V	80 A	1240 A <sup>2</sup> s	7600 A <sup>2</sup> s	13.8 W	10	60 g
FR22GR69V100T	F1018629	690 V	100 A	2470 A <sup>2</sup> s	14500 A <sup>2</sup> s	16 W	10	60 g
FR22GR69V125T	G1018630	690 V	125 A	3360 A <sup>2</sup> s	16800 A <sup>2</sup> s	22.8 W	10	60 g
FR22GR69V135T	H1018631	690 V	135 A	4390 A <sup>2</sup> s	19800 A <sup>2</sup> s	25.5 W	10	60 g



FR22GR69V12

### CP 22x58 gR without striker

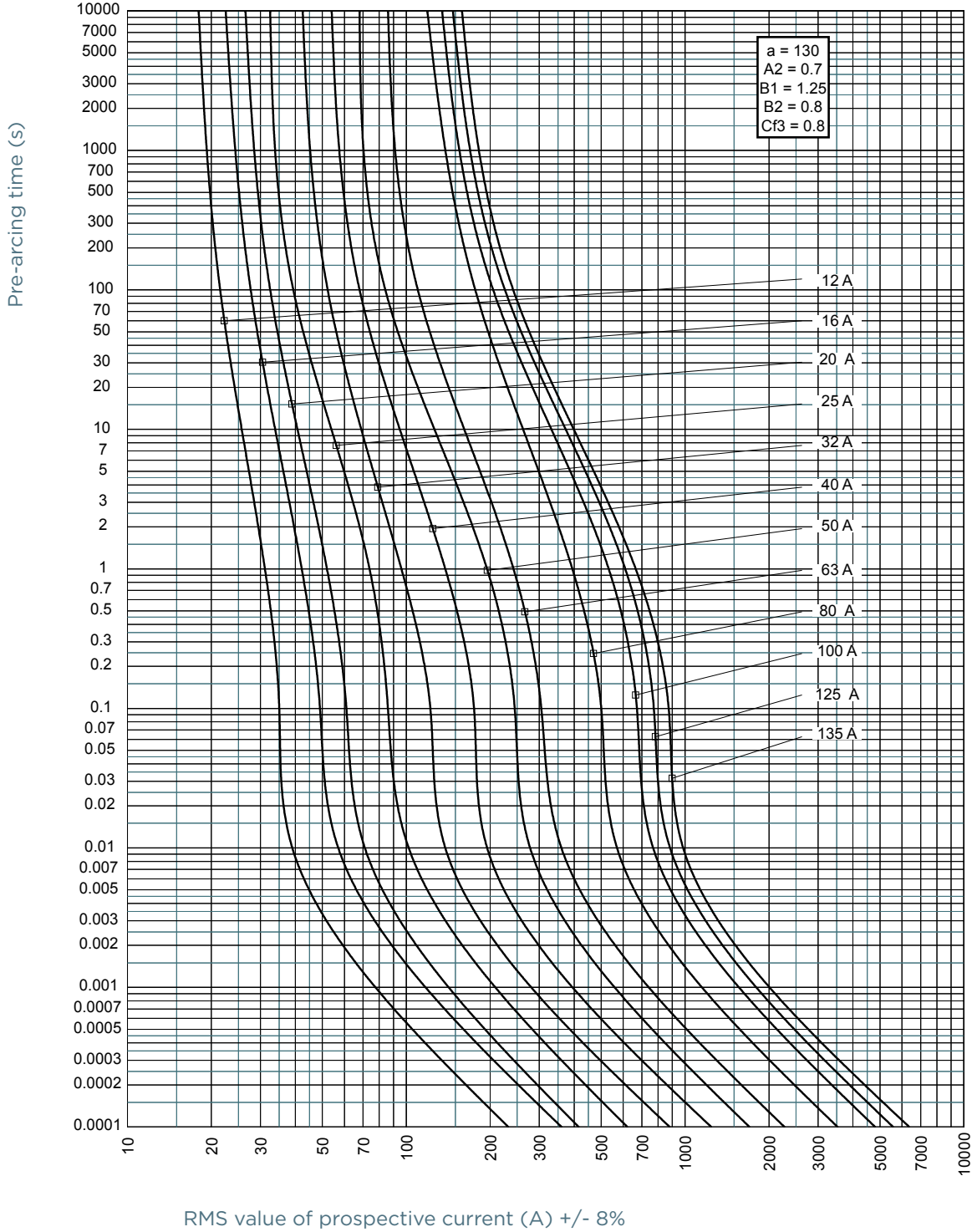
Catalog number	Item number	Rated voltage AC (IEC)	Rated current I <sub>n</sub>	Pre-arcing I <sup>2</sup> t	Clearing I <sup>2</sup> t at Rated Voltage	Power dissipation at I <sub>n</sub>	Package	Weight
FR22GR69V12	W1018551	690 V	12 A	5.4 A <sup>2</sup> s	60 A <sup>2</sup> s	4.4 W	10	60 g
FR22GR69V16	X1018552	690 V	16 A	13.1 A <sup>2</sup> s	125 A <sup>2</sup> s	4.65 W	10	60 g
FR22GR69V20	Y1018553	690 V	20 A	17.1 A <sup>2</sup> s	160 A <sup>2</sup> s	7 W	10	60 g
FR22GR69V25	Z1018554	690 V	25 A	38.6 A <sup>2</sup> s	315 A <sup>2</sup> s	7.65 W	10	60 g
FR22GR69V32	A1018555	690 V	32 A	77.4 A <sup>2</sup> s	670 A <sup>2</sup> s	9.1 W	10	60 g
FR22GR69V40	B1018556	690 V	40 A	154 A <sup>2</sup> s	1050 A <sup>2</sup> s	9.5 W	10	60 g
FR22GR69V50	C1018557	690 V	50 A	292 A <sup>2</sup> s	2050 A <sup>2</sup> s	11.8 W	10	60 g
FR22GR69V63	D1018558	690 V	63 A	519 A <sup>2</sup> s	3350 A <sup>2</sup> s	13.6 W	10	60 g
FR22GR69V80	E1018559	690 V	80 A	1240 A <sup>2</sup> s	7600 A <sup>2</sup> s	13.8 W	10	60 g
FR22GR69V100	F1018560	690 V	100 A	2470 A <sup>2</sup> s	14500 A <sup>2</sup> s	16 W	10	60 g
FR22GR69V125	G1018561	690 V	125 A	3360 A <sup>2</sup> s	16800 A <sup>2</sup> s	22.8 W	10	60 g
FR22GR69V135	H1018562	690 V	135 A	4390 A <sup>2</sup> s	19800 A <sup>2</sup> s	25.5 W	10	60 g

# Protistor® size 22x58 gR

690VAC (IEC) / 700VAC (UL)

## TIME CURRENT CHARACTERISTIC CURVES

Size 22x58 gR



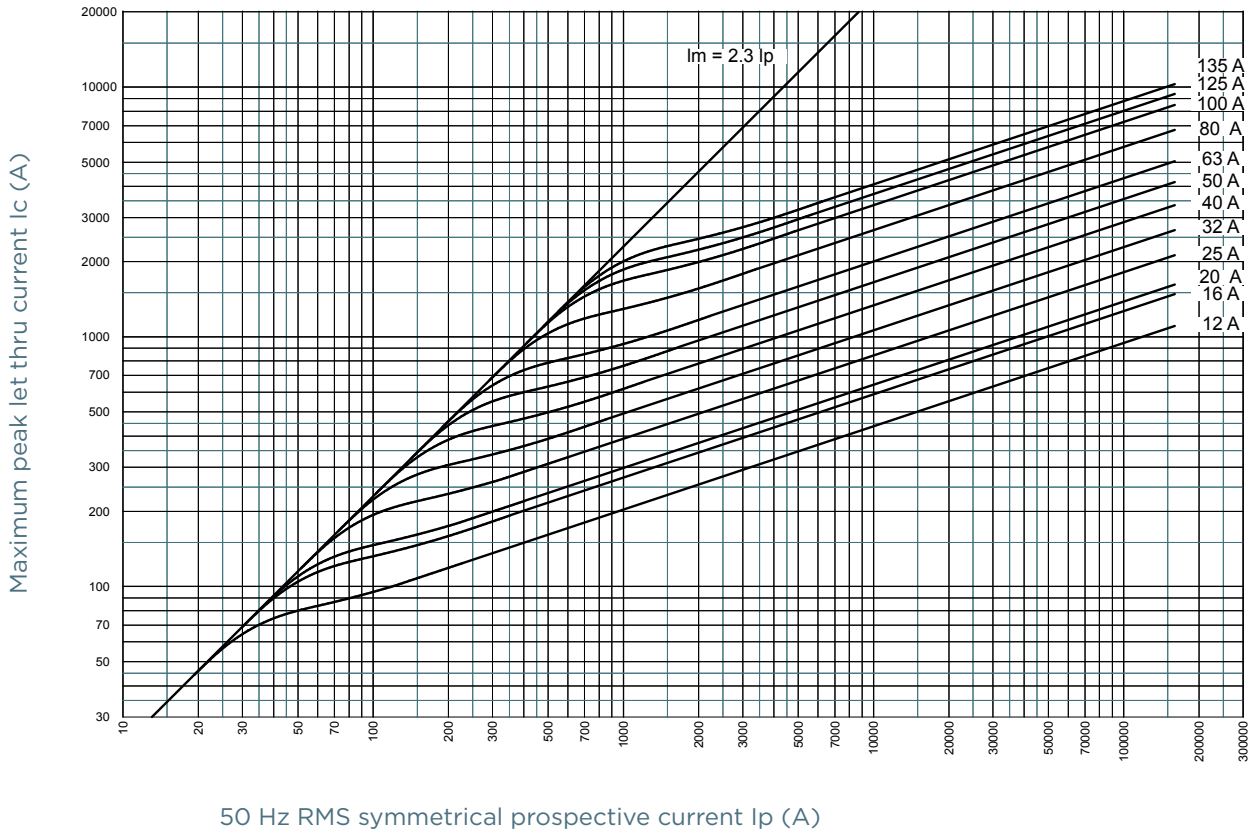
MERSEN reserves the right to change, update or correct, without notice, any information contained in this datasheet.

# Protistor® size 22x58 gR

690VAC (IEC) / 700VAC (UL)

## CUT-OFF CURRENT CHARACTERISTIC

### Size 22x58 gR



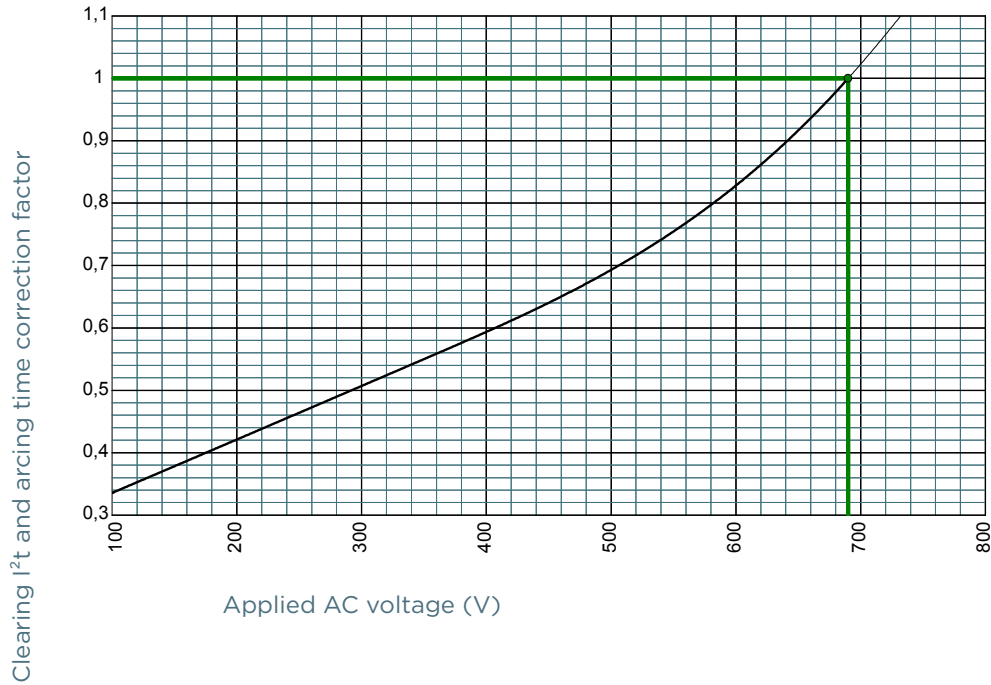
MERSEN reserves the right to change, update or correct, without notice, any information contained in this datasheet.

# Protistor® size 22x58 gR

690VAC (IEC) / 700VAC (UL)

## I<sup>2</sup>T MULTIPLIER COEFFICIENT

### Size 22x58 gR



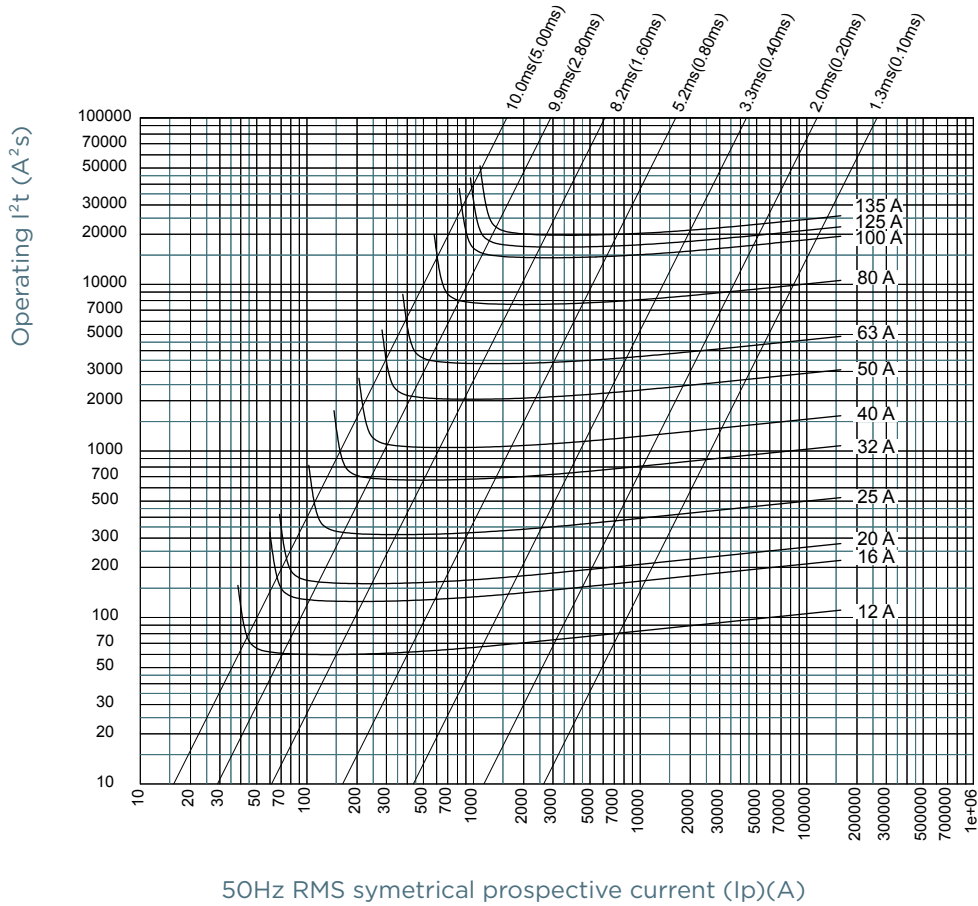
MERSEN reserves the right to change, update or correct, without notice, any information contained in this datasheet.

# Protistor® size 22x58 gR

690VAC (IEC) / 700VAC (UL)

## CHARACTERISTICS TOTAL I<sup>2</sup>T CURVE

Size 22x58 gR



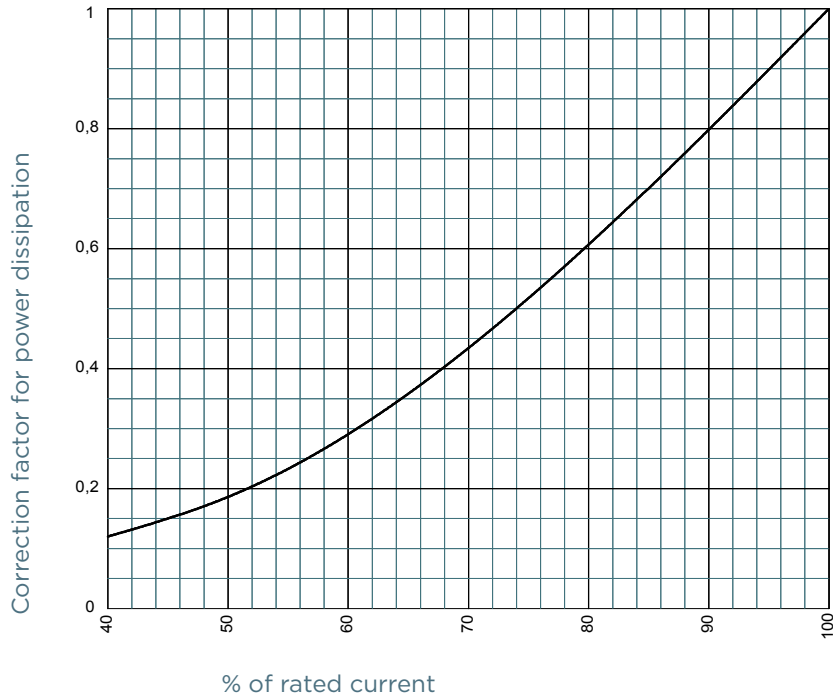
MERSEN reserves the right to change, update or correct, without notice, any information contained in this datasheet.

# Protistor® size 22x58 gR

690VAC (IEC) / 700VAC (UL)

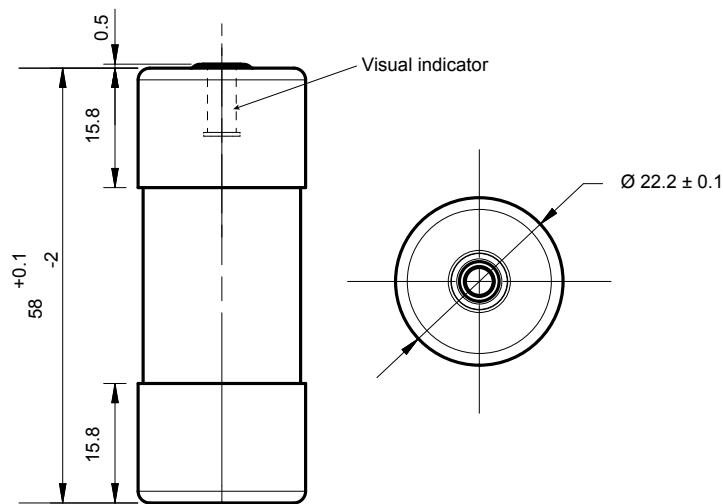
## POWER DISSIPATION

### Size 22x58 gR



## DIMENSIONS

### CP 22x58 gR with striker (100213)



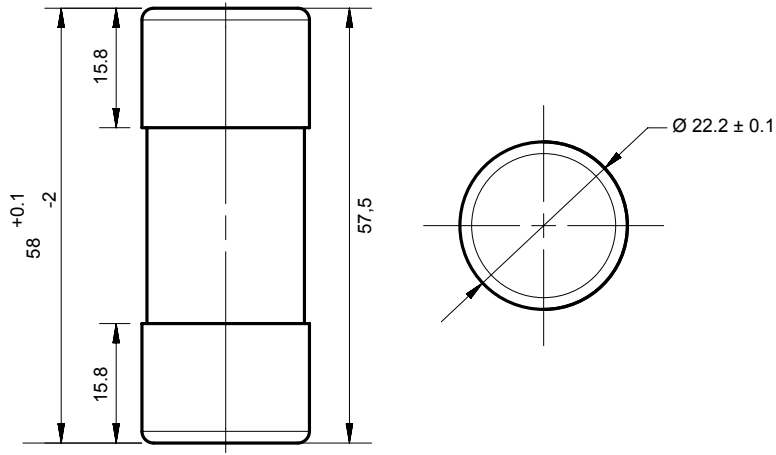
Dimensions in mm

# Protistor® size 22x58 gR

690VAC (IEC) / 700VAC (UL)

## DIMENSIONS

**CP 22x58 gR without striker** (100214)



Dimensions in mm