

# Semiconductor Fuses



European Fuses

## French Ferrule

## 660 gRB



660 V AC  
gRB - from 1 up to 30 A  
Size: 10x38

↓ The fuse preselection table below indicates:

- rated current (or rating)  $I_N$
- pre-arcing  $I^2t$  ( $I^2t_p$ ) at 1 ms
- total operating  $I^2t$  ( $I^2t$ ) at 660 V,  $\cos \varphi=0.15$ , and for a total operating time from 8 to 10 ms
- dissipated power  $P_N$  at the rated current  $I_N$ , and at  $0.8 I_N$ , in steady state
- Nominal breaking capacity, checked by tests made in accordance with IEC standard.

### Fuse preselection

Rated current	Pre-arcing $I^2t$	Total $I^2t$ at 660VAC	Dissipated power		Peak arc voltage	Breaking capacity
			at $I_N$	at $0.8 I_N$		
$I_N$ (A)	$I^2t_p$ (A <sup>2</sup> s)	$I^2t$ (A <sup>2</sup> s)			(V)	I (kA)
1	0,066	0,21	1	0,57	2500	160 kA 700 V (US)
1,25	0,115	0,36	1,25	0,7		
1,5	0,185	0,57	1,5	0,81		
2	0,42	1,3	2	1,1		
2,5	0,88	2,7	2,1	1,15		
3	1,55	4,6	2,3	1,25		
4	4	12	2,6	1,35		
5	8,6	25	2,7	1,4		
6	15	44	2,9	1,5		
8	3,3	33	2,4	1,35		
10	5,4	55	3,4	1,85		
12,5	8,5	82	3,4	1,9		
16	16	145	4,1	2,3		
20	30	250	4,3	2,4		
25	58	470	4,7	2,7		
30 - 32	96	740	5	2,9		

# Semiconductor Fuses

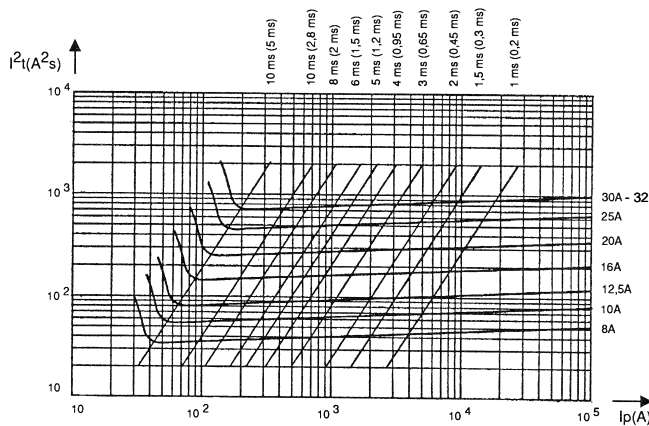
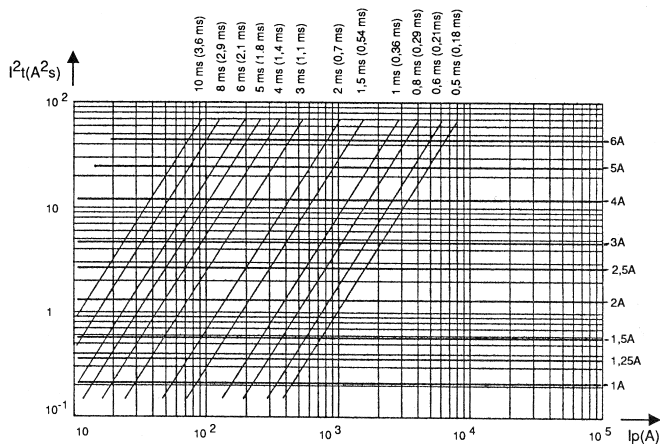


European Fuses

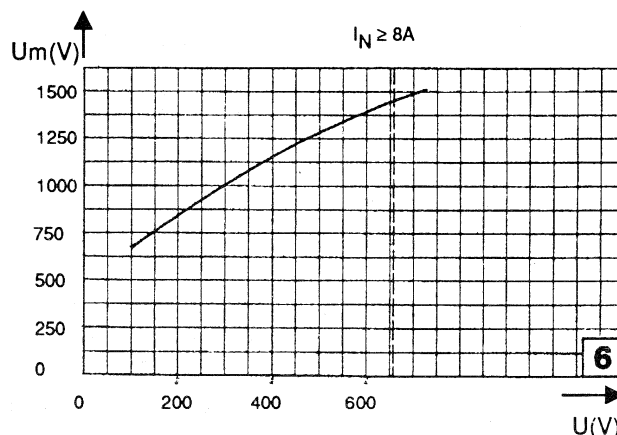
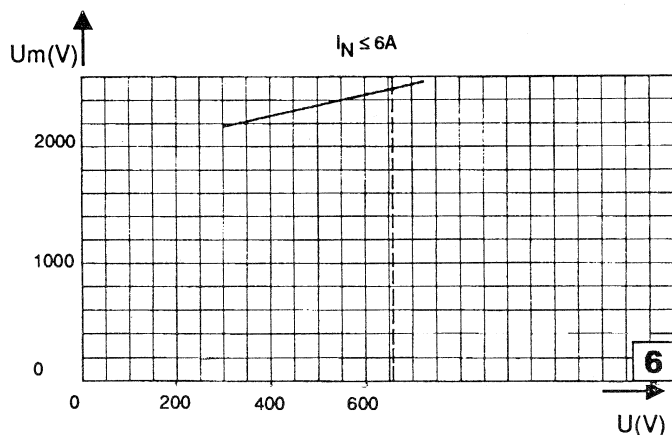
## French Ferrule

## 660 gRB

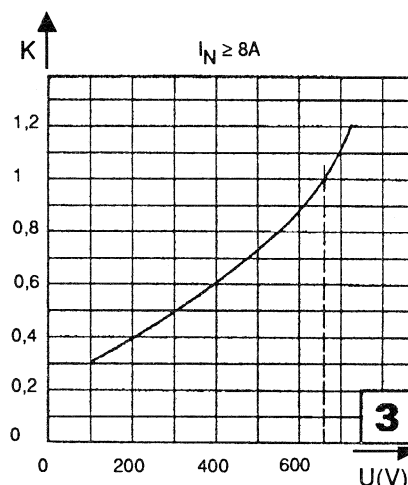
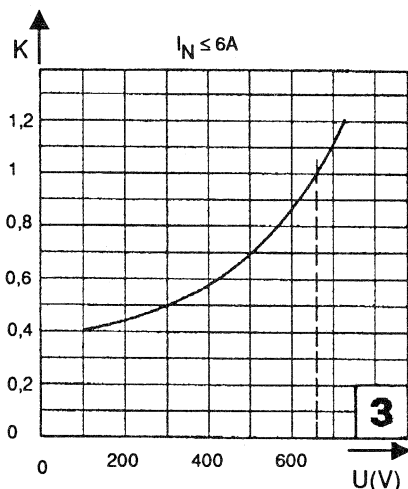
### Maximum values of total operating $I^2t$ and total operating times



### Arc voltage



### Multiplier coefficient



# Semiconductor Fuses

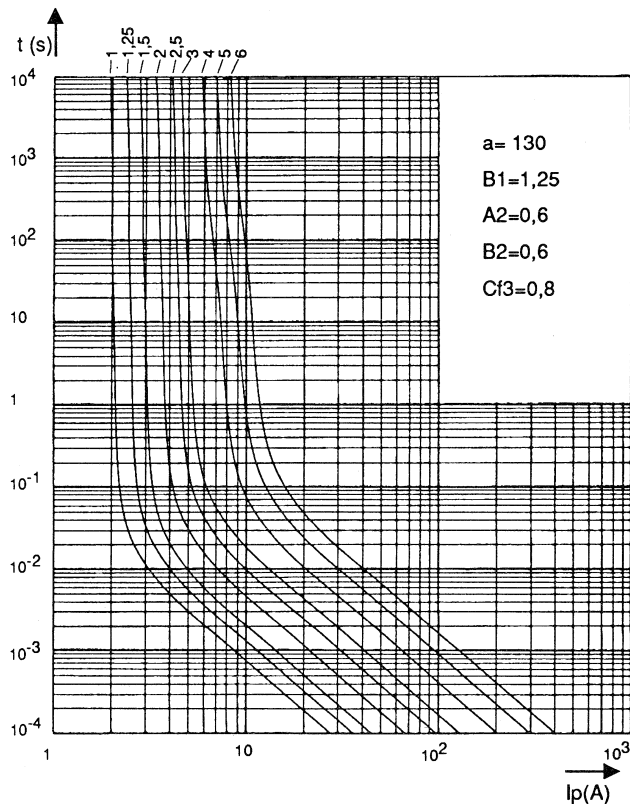


European Fuses

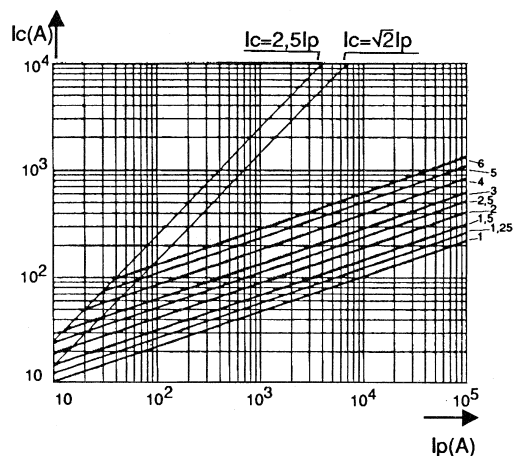
## French Ferrule

660 gRB

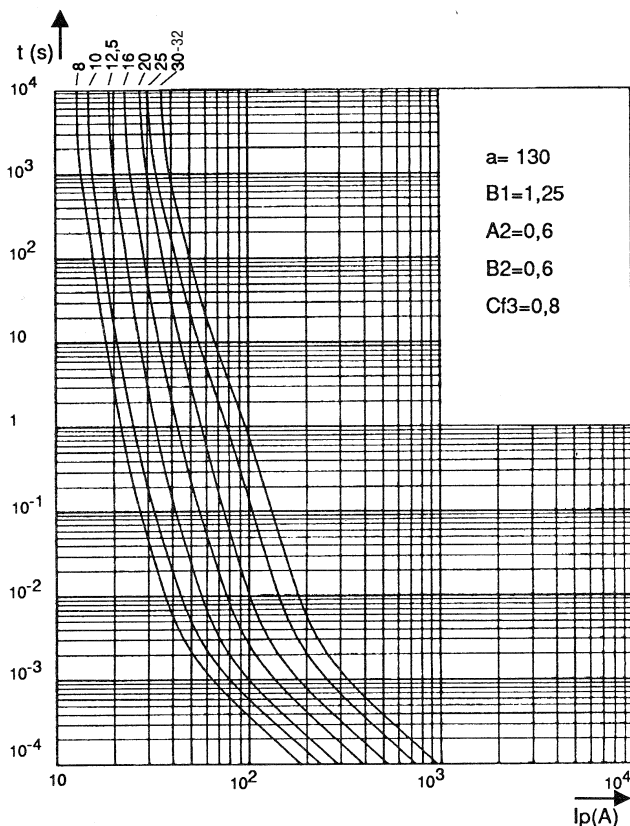
### Time-current characteristics (1 to 6 A)



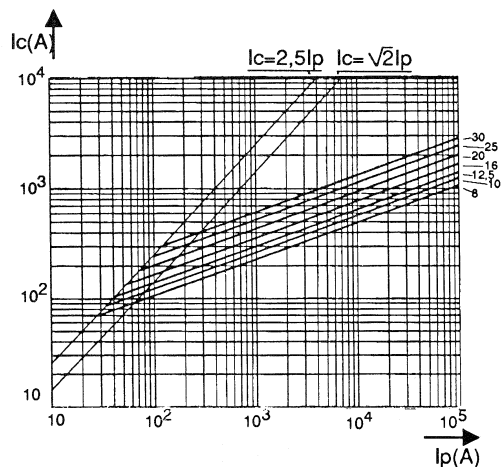
### Cut-off characteristics



### Time-current characteristics (8 to 30 A)



### Cut-off characteristics



# Semiconductor Fuses

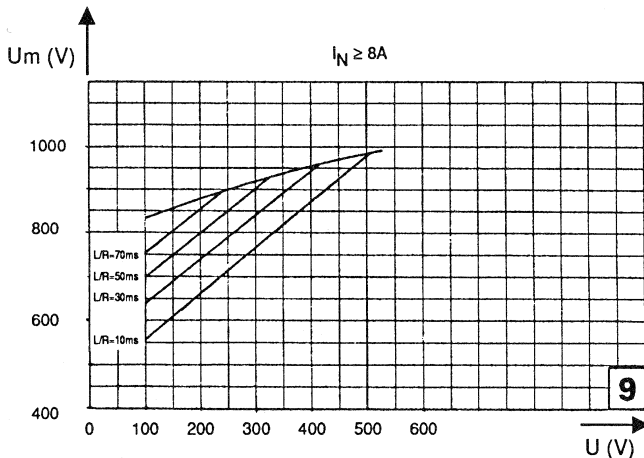
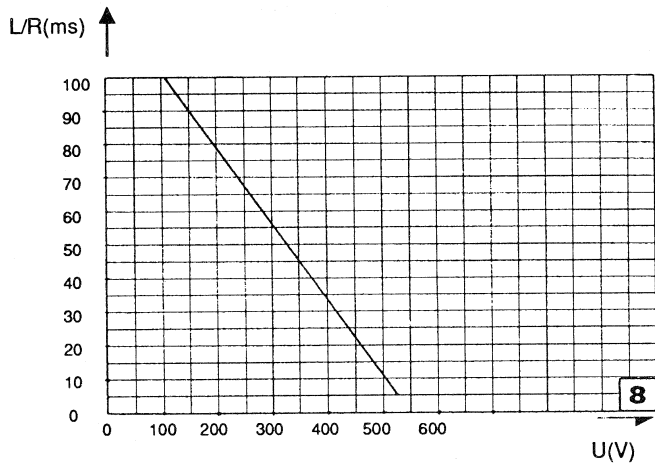


European Fuses

## French Ferrule

## 660 gRB

### DC working voltage possibilities



↑ Above: Curve indicating the maximum time constant L/R of the fault path as a function of the DC voltage U, for the rated currents from 1 to 30 A of this range.

↖ Far left (top and bottom): Curves indicate, for each rated current, pre-arcing time as a function of RMS value of pre-arcing current I.

Tolerances on this current:

±10% = ratings from 1 to 6 A

±9% = ratings from 8 to 30 A

Fuses with "gR" characteristics can eliminate all overloads. They do not show any minimum breaking capacity but limit currents of non-operation or operation in compliance with standard VDE 636/23.

← Near left (top and bottom): Curves indicate, for each rated current, the peak value  $I_c$  that the current may reach as a function of prospective fault current  $I_p$ .

See Fuse Blocks and Fuse Holders, and Medium Voltage fuse clips

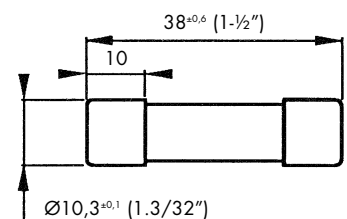
### Dimensions / Reference / Ref. No.

Rating (A)	Catalog Number	Ref. Number
1	660 gRB 10-01 A070 gRB 01 T13	W330000
1,25	660 gRB 10-1,25 A070 g RB 1.25 T13	X330001
1,5	660 gRB 10-1,5 A070 gRB 1.5 T13	Y330002
2	660 gRB 10-02 A070 gRB 02 T13	Z330003
2,5	660 gRB 10-2,5 A070 gRB 2.5 T13	A330004
3	660 gRB 10-03 A070 gRB 03 T13	B330005
4	660 gRB 10-04 A070 gRB 04 T13	C330006
5	660 gRB 10-05 A070 gRB 05 T13	D330007
6	660 gRB 10-06 A070 gRB 06 T13	E330008
8	660 gRB 10-08 A070 gRB 08 T13	F330009
10	660 gRB 10-10 A070 gRB 10 T13	G330010
12,5	660 gRB 10-12,5 A070 gRB 12.5 T13	H330011
16	660 gRB 10-16 A070 gRB 16 T13	J330012
20	660 gRB 10-20 A070 gRB 20 T13	K330013
25	660 gRB 10-25 A070 gRB 25 T13	L330014
30	660 gRB 10-30 A070 gRB 30T13	M330015
32	660 gRB 10-32 A070 gRB 32T13	Y330278

Without trip-indicator

Max. weight 10g

Packaging: per 10 pieces



Note: fuses bear European and American reference.

# Semiconductor Fuses



European Fuses

## French Ferrule

## 6.600-6.621 cp UR

660 V AC

URC - URD from 6 up to 100 A

Sizes: 14x51 - 22x58

EXTREMELY HIGH INTERRUPTING RATING FUSES:  
PROTECTION OF POWER SEMI CONDUCTORS COMPLYING  
WITH IEC STANDARD 269.1 AND 4

660 V AC VOLTAGE RATING

aR-CLASS ACCORDING TO VDE 636-23 AND IEC 269.4

TWO MODELS ACCORDING TO NF C 63210 AND 63211  
WITH AND WITHOUT BUILT-IN BLOWN FUSE  
TRIP-INDICATOR FOR SIZES 14 x 51 AND 22 x 58

UL RECOGNIZED  us (EXCEPT 6 A)\*



### MAIN CHARACTERISTICS

Voltage rating $U_N$ (VAC)	Size	Class	Current rating $I_N$ (A)	Pre-arcing $I^2t @ 1 \text{ ms}$ $I^2t_p$ (A <sup>2</sup> s)	Total clearing $I^2t @$ (A <sup>2</sup> s) 660 V		Watts loss		Tested interrupting rating	
					$0.8 I_N$	$I_N$	$0.8 I_N$	$I_N$		
660 V	14 x 51	URC	6	1.3	17.5*		1.1	2	100 kA @ 660 V	
			8	2.4	27.5		1.6	2.8		
			10	4.3	40		2	3.5		
			12	5.4	60		2.45	4.4		
			16	13.2	100		2.7	4.8		
			20	27	160		2.9	5.2		
			25	53	275		3.2	5.8		
			32	98	500		3.9	7		
			40 (1)	130	700		6	10.7		
			50 (1)	280	1500		6.3	11.6		
	22 x 58	URD	40 (2)	130	$7 I_N < I_p < 30 I_N$	$I_p$	30 $I_N$	6	10.7	100 kA @ 660 V
			50 (2)	280	850	700	1500	6.3	11.6	
		URD	25	22	125		5.2	10	100 kA @ 660 V	
			32	49	275		5.7	11		
40	88		480		6.8	13				
50	155		800		7.8	14.9				
	63	350	1850		8.4	16				
	80	730	3800		9.4	17.8				
	100	1560	8000		10	19				

\* Without trip-indicator  $I^2t$ : 15 A<sup>2</sup>s.

(1) No trip-indicator available for this model.

(2) Models available only with trip-indicator.

Minimum operating voltage for built-in trip-indicator: 20 V.

# Semiconductor Fuses



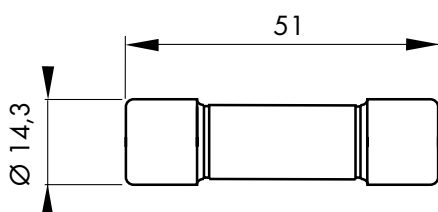
European Fuses

## French Ferrule

## 6.600-6.621 cp UR

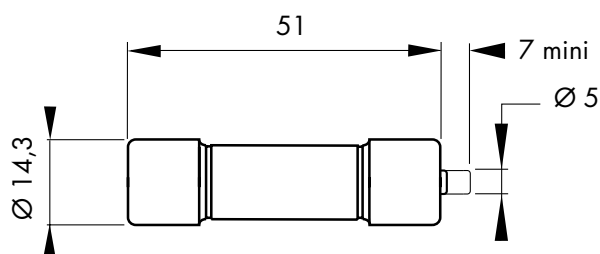
All the fuses presented on this page are **CS** **us** (except 6 A)\*

### 14x51 - Without blown fuse indication



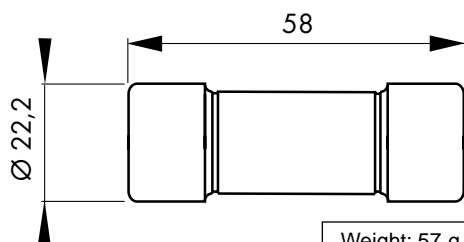
Weight : 18g  
Packaging : 10 pieces

### 14x51 - With blown fuse trip-indicator



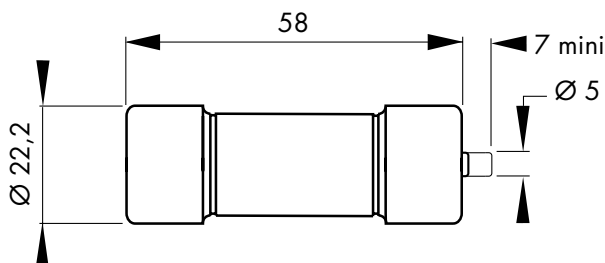
Weight : 18g  
Packaging : 10 pieces

### 22x58 - Without blown fuse indication



Weight: 57 g  
Packaging: 10 pieces

### 22x58 - With blown fuse trip-indicator



Weight: 57 g  
Packaging: 10 pieces

Current Rating	Catalog Number	Ref. Number
6 A	6.600 CP URC 14.51/6*	K081475
8 A	6.600 CP URC 14.51/8	S093902
10 A	6.600 CP URC 14.51/10	T093903
12 A	6.600 CP URC 14.51/12	V093904
16 A	6.600 CP URC 14.51/16	W093905
20 A	6.600 CP URC 14.51/20	X093906
25 A	6.600 CP URC 14.51/25	Y093907
32 A	6.600 CP URC 14.51/32	Z093908
40 A	6.600 CP URC 14.51/40	A093909
50 A	6.600 CP URC 14.51/50	B093910

Current Rating	Catalog Number	Ref. Number
6 A	6.621 CP URC 14.51/6*	G081518
8 A	6.621 CP URC 14.51/8	C093911
10 A	6.621 CP URC 14.51/10	D093912
12 A	6.621 CP URC 14.51/12	E093913
16 A	6.621 CP URC 14.51/16	F093914
20 A	6.621 CP URC 14.51/20	G093915
25 A	6.621 CP URC 14.51/25	H093916
32 A	6.621 CP URC 14.51/32	J093917
40 A	6.621 CP URD 14.51/40	T100136
50 A	6.621 CP URD 14.51/50	V100137

Current Rating	Catalog Number	Ref. Number
25 A	6.600 CP URD 22x58/25	B093956
32 A	6.600 CP URD 22x58/32	Z094828
40 A	6.600 CP URD 22x58/40	S094822
50 A	6.600 CP URD 22x58/50	W094779
63 A	6.600 CP URD 22x58/63	T094823
80 A	6.600 CP URD 22x58/80	A094829
100 A	6.600 CP URD 22x58/100	Y094827

Current Rating	Catalog Number	Ref. Number
25 A	6.621 CP URD 22x58/ 25	H093801
32 A	6.621 CP URD 22x58/ 32	C093957
40 A	6.621 CP URD 22x58/ 40	J093802
50 A	6.621 CP URD 22x58/ 50	D093958
63 A	6.621 CP URD 22x58/ 63	K093803
80 A	6.621 CP URD 22x58/ 80	E093959
100 A	6.621 CP URD 22x58/100	F093960

See Fuse Blocks and Fuse Holders section and Medium Voltage fuse clips

# Semiconductor Fuses

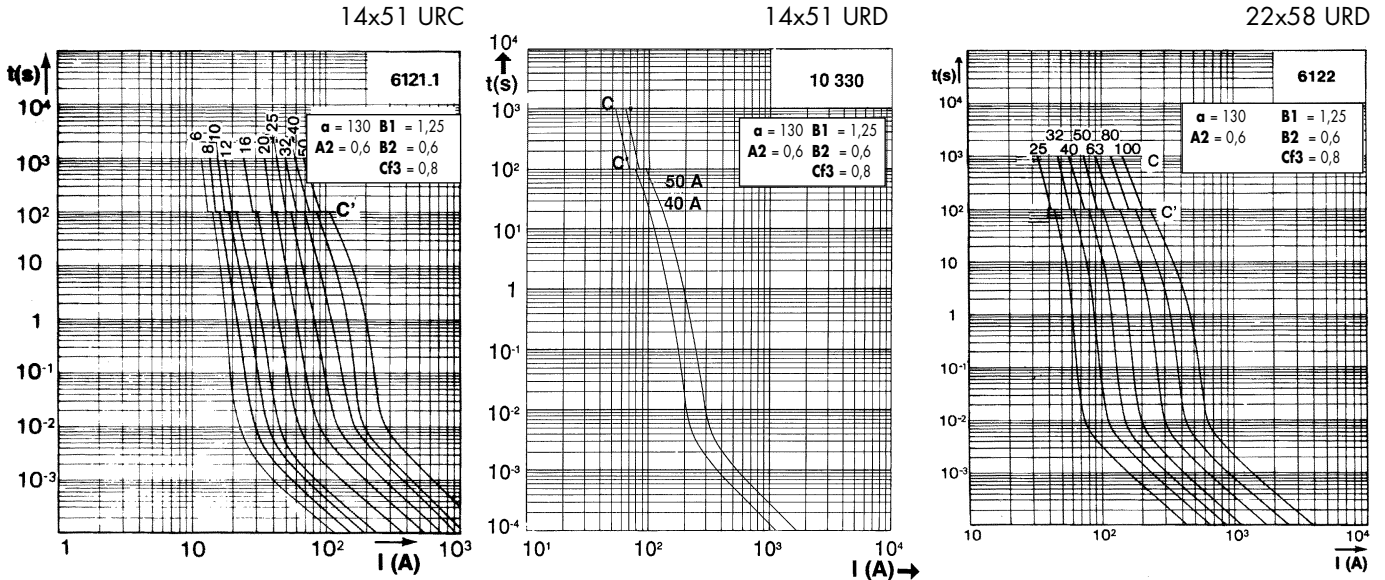


European Fuses

## French Ferrule

## 6.600-6.621 cp UR

### Time vs current characteristics

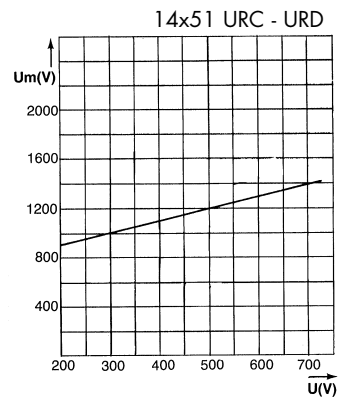
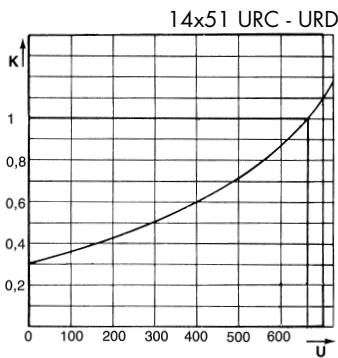


These curves indicate, for each rated current, pre-arcing time vs. R.M.S. pre-arcing current.

**Tolerance for mean pre-arcing current  $\pm 10\%$**

### Corrective factor - Peak arc voltage

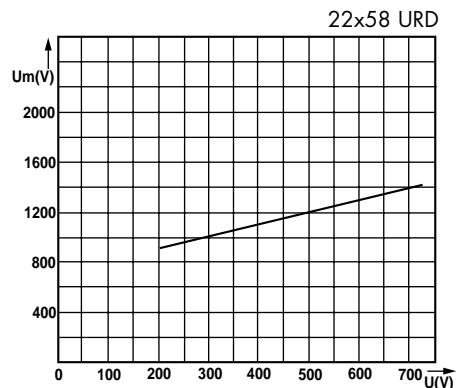
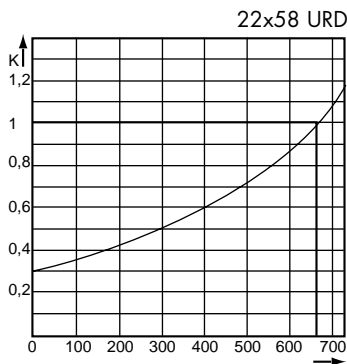
Corrective factor



Peak arc voltage

The mean curves show the variation of the total clearing time ( $I^2t_f$ ) and the total clearing duration  $t_f$  as a function of operating voltage U.

This curve shows the peak value  $U_m$  of the arc voltage which appears across the fuse-link as a function of the operating voltage U @  $\cos \phi = 0.15$ .



# Semiconductor Fuses



European Fuses

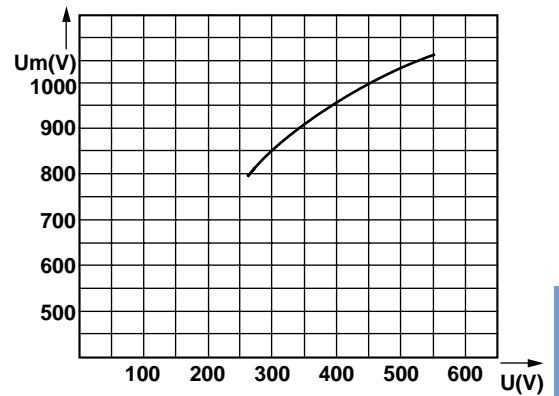
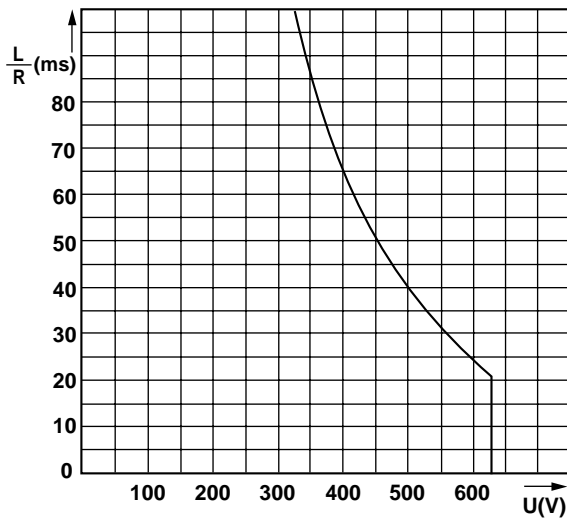
## French Ferrule

## 6.600-6.621 cp UR

### DC Application data

14x51 URC - URD

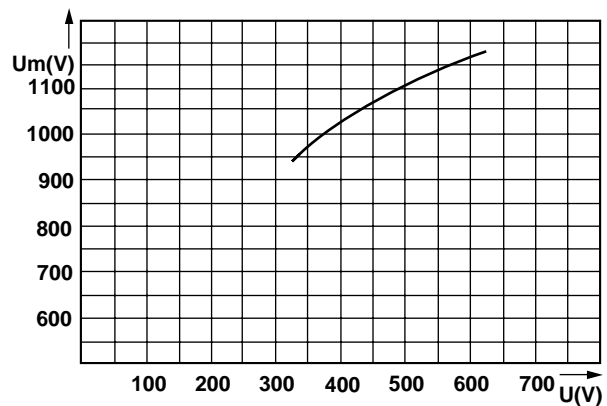
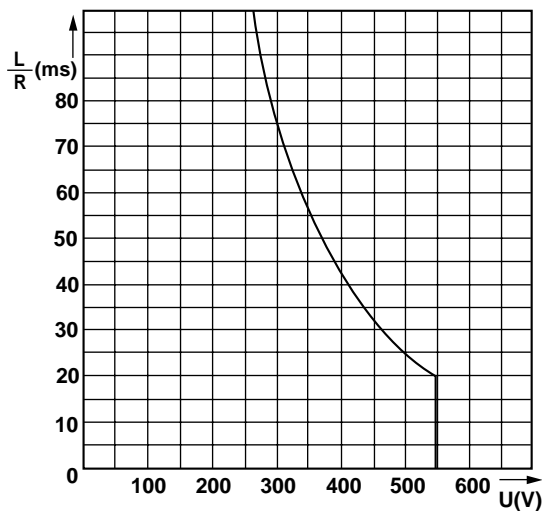
14x51 URC - URD



Minimum breaking current: see time-current characteristics

22x58 URD

22x58 URD



This curve indicates the permissible value of time constant  $L/R$  as a function of DC working voltage

This curve shows the peak value  $U_m$  of the arc voltage which appears across the fuse-link as a function of the operating voltage  $U$ .



# Semiconductor Fuses



European Fuses

## French Ferrule

## 6.600-6.621 cp URG

600 V - 660 V AC  
URGB - URGA - from 8 to 100 A  
Sizes: 14x51 - 22x58

- EXTREMELY HIGH INTERRUPTING RATING FUSES: PROTECTION OF POWER SEMICONDUCTORS AS PER IEC STANDARD 269.1 AND 4
- 600 V - 660 V AC VOLTAGE RATING
- aR CLASS AS PER VDE 636-23 AND IEC 269.4
- TWO MODELS COMPLYING WITH NF C 63210 AND 63211 WITH AND WITHOUT BUILT-IN BLOWN FUSE TRIP-INDICATOR FOR SIZES 14 x 51 AND 22 x 58



### MAIN CHARACTERISTICS

Voltage rating $U_N$ (V AC)	Size	Class	Current rating $I_N$ (A)	Pre-arcing $I^2t @ 1 \text{ ms}$ $I^2t_p$ (A <sup>2</sup> s)	Total clearing $I^2t @ A^2s$ 660 V		Watts loss		Tested interrupting rating
					$I_p < 30 I_N$	$I_p > 30 I_N$	$0,8 I_N$	$I_N$	
660 V	14 x 51	URGB	8	3.3	20	17	1.45	2.7	200 kA @ 660 V
			10	6.0	37	30	1.85	3.4	
			12	9.3	75	60	2.5	4.6	
			16	15.6	95	75	3.4	6.2	
			20	30.0	175	145	4	7.4	
			25	53.5	300	250	4.7	8.6	
			32	100	550	460	5.7	10.6	
			40	214	1150	940	6.2	11.5	
			50	480	2550	2070	7	13	
	22 x 58	URGA	25	45	210		4.7	8.5	200 kA @ 660 V
			32	84	400		5.7	10.3	
			40	150	700		7.1	12.8	
			50	270	1270		8.7	15.7	
			63	595	2770		9.8	17.7	
			80	1165	5500		12	21.7	
	100*	2150	9000*		14.2	25.6	600 V		

\*Operating voltage limited to 600 V for the model with blown fuse trip-indicator / Total clearing  $I^2t @ 600 \text{ V} = 9000 \text{ A}^2s$   
Minimum operating voltage for built-in trip-indicator: 20 V

# Semiconductor Fuses



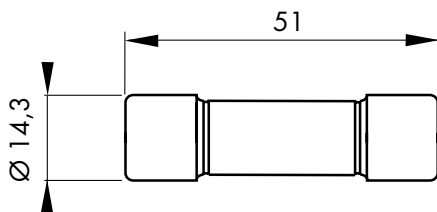
European Fuses

## French Ferrule

## 6.600-6.621 cp URG

### REFERENCES

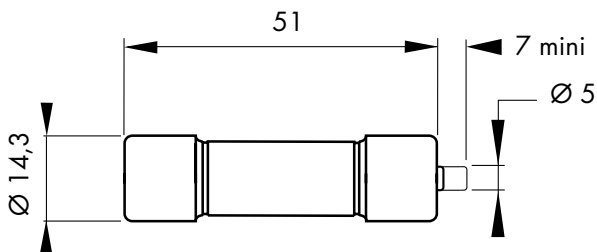
#### 14x51 - Without blown fuse trip-indicator



Weight: 18 g  
Packaging: 10 pieces

Current Rating	Catalog Number	Ref. Number
8 A	6.600 CP URGB 14.51/8	T 078033
10 A	6.600 CP URGB 14.51/10	V 078034
12 A	6.600 CP URGB 14.51/12	W 078035
16 A	6.600 CP URGB 14.51/16	X 078036
20 A	6.600 CP URGB 14.51/20	Y 078037
25 A	6.600 CP URGB 14.51/25	Z 078038
32 A	6.600 CP URGB 14.51/32	A 078039
40 A	6.600 CP URGB 14.51/40	B 078040
50 A	6.600 CP URGB 14.51/50	C 078041

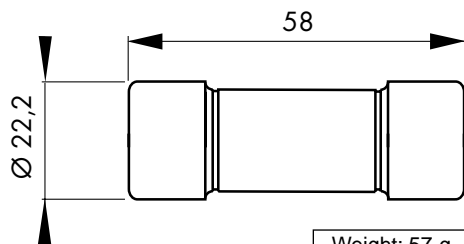
#### 14x51 - With blown fuse trip-indicator



Weight: 18 g  
Packaging: 10 pieces

Current Rating	Catalog Number	Ref. Number
8 A	6.621 CP URGB 14.51/8	D 078042
10 A	6.621 CP URGB 14.51/10	E 078043
12 A	6.621 CP URGB 14.51/12	F 078044
16 A	6.621 CP URGB 14.51/16	G 078045
20 A	6.621 CP URGB 14.51/20	H 078046
25 A	6.621 CP URGB 14.51/25	J 078047
32 A	6.621 CP URGB 14.51/32	K 078048
40 A	6.621 CP URGB 14.51/40	L 078049
50 A	6.621 CP URGB 14.51/50	M 078050

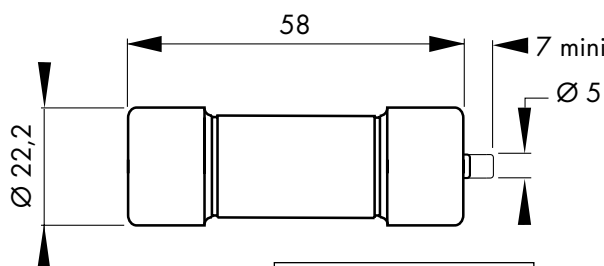
#### 22x58 - Without blown fuse trip-indicator



Weight: 57 g  
Packaging: 10 pieces

Current Rating	Catalog Number	Ref. Number
25 A	6.600 CP URG A 22.58/25	C 095245
32 A	6.600 CP URG A 22.58/32	D 095246
40 A	6.600 CP URG A 22.58/40	E 095247
50 A	6.600 CP URG A 22.58/50	F 095248
63 A	6.600 CP URG A 22.58/63	G 095249
80 A	6.600 CP URG A 22.58/80	H 095250
100 A	6.600 CP URG A 22.58/100	N 078051

#### 22x58 - With blown fuse trip-indicator



Weight: 57 g  
Packaging: 10 pieces

Current Rating	Catalog Number	Ref. Number
25 A	6.621 CP URG A 22.58/25	T 095260
32 A	6.621 CP URG A 22.58/32	V 095261
40 A	6.621 CP URG A 22.58/40	W 095262
50 A	6.621 CP URG A 22.58/50	X 095263
63 A	6.621 CP URG A 22.58/63	Y 095264
80 A	6.621 CP URG A 22.58/80	Z 095265
100 A	6.621 CP URG A 22.58/100	N 098222

See Fuse Blocks and Fuse Holders section and Medium Voltage fuse clips

# Semiconductor Fuses



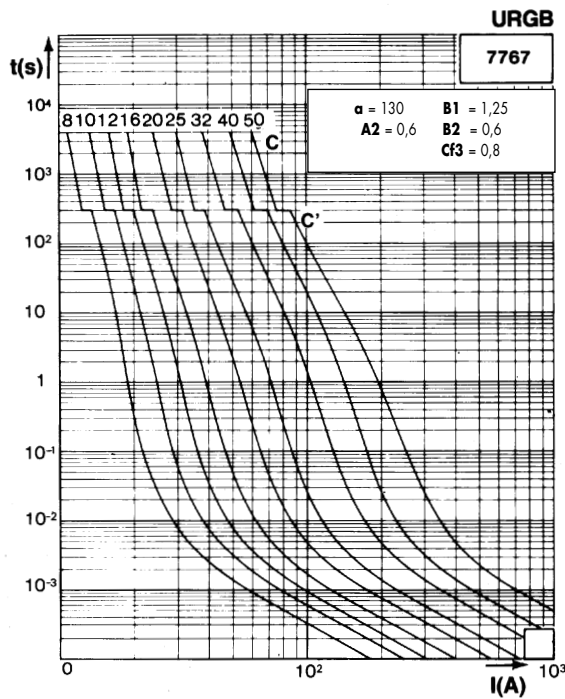
European Fuses

## French Ferrule

## 6.600-6.621 cp URG

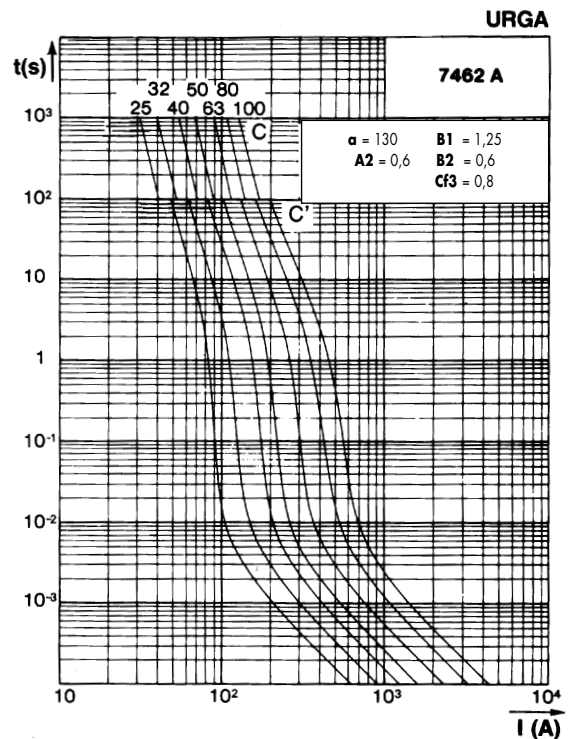
### ELECTRICAL CHARACTERISTICS

#### Time vs current characteristics



Tolerance of mean pre-arcing current  $\pm 10\%$

These curves indicate, for each rated current, pre-arcing time vs. R.M.S. pre-arcing current.



Tolerance for mean pre-arcing current  $\pm 8\%$ .

# Semiconductor Fuses



European Fuses

## French Ferrule

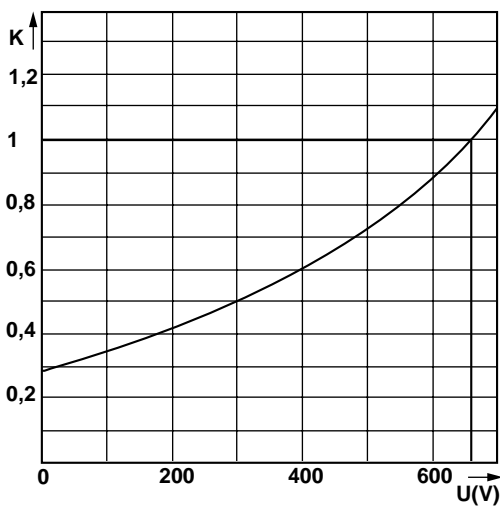
## 6.600-6.621 cp URG

### Corrective factor - Peak arc voltage

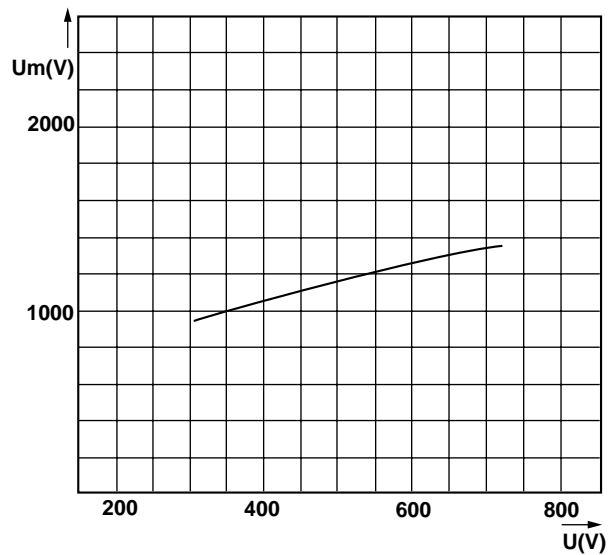
Corrective factor

Peak arc voltage

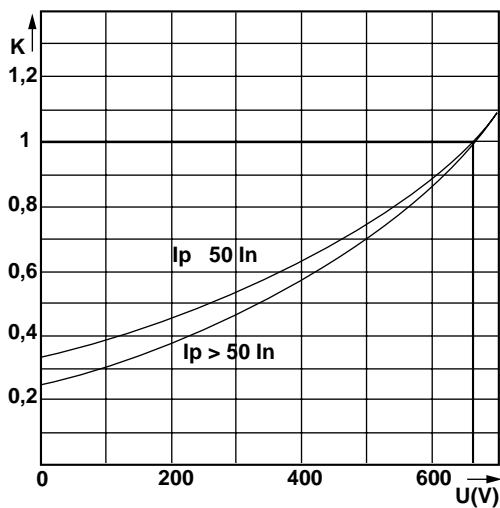
URGB



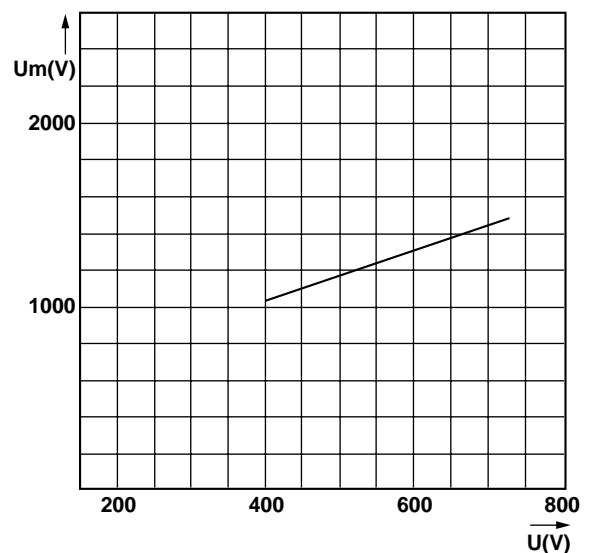
URGB



URGA



URGA



These mean curves show the variation of the total clearing time ( $I^2t_f$ ) and the total clearing duration  $t_f$  as a function of operating voltage  $U$ .

This curve shows the peak value  $U_m$  of the arc voltage which appears across the fuse link as a function of operating voltage  $U$  @  $\cos \phi = 0.15$ .

# Semiconductor Fuses




European Fuses

## French Ferrule

## 6.900-6.921 cp gRC-URC

600 - 690 V ~  
gRC - URC from 1 to 63 A  
Size: 14 x 51

- EXTREMELY HIGH INTERRUPTING-RATING FUSES:  
PROTECTION OF SEMICONDUCTORS  
COMPLYING WITH IEC STANDARD 269.1 AND 4
- 690 V VOLTAGE RATING (CURRENT RATING 1 TO 50 A)  
AS PER IEC 33
- gR CLASS (CURRENT RATING 1 TO 50 A) AS PER VDE 636-23
  - CLEARING ALL OVERLOADS
  - IMPROVED SAFETY AND PROTECTION
  - ENABLING SELECTIVE COORDINATION AMONG ALL DISTRIBUTION CIRCUIT FUSES
- aR CLASS (CURRENT RATING 63 A) ACCORDING TO VDE 636-23  
AND IEC 269.4
- TWO MODELS AS PER NF C 63210 AND 63211  
WITH OR WITHOUT TRIP-INDICATOR
- gRC fuses are 700VAC-DC UL Recognized 



### MAIN CHARACTERISTICS

Voltage rating $U_N$ (V)	Class	Current rating $I_N$ (A)	Pre-arcing $I^2t @ 1 \text{ ms}$ $I^2t_p$ (A <sup>2s</sup> )	Total clearing $I^2t @ U_N$ $I^2t_t$ (A <sup>2s</sup> )	Watts loss		Tested interrupting rating	Estimated interrupting rating
					0.8 $I_N$	$I_N$		
690	gRC	1	0.8/0.31*	3.5/1.4*	0.17	0.35	100k A @ 690 V	300k A @ 690 V
		2	1.5/1*	6.7/4.3*	0.33	0.60		
		4	7.2/6.7*	33/30*	0.77	1.4		
		6	1.4	19	1.3	2.5		
		8	2.4	30	1.5	3.0		
		10	4.3	44	1.75	3.3		
		12	5.4	65	2.25	4.25		
		16	13	110	2.5	4.8		
		20	27	175	2.75	5.25		
		25	53	300	3.0	5.8		
		32	97	550	3.5	7.0		
		40	210	1210	4.5	8.8		
		50	390	2250	5.0	10		
600	URC	63	440	2200	8.0	16	100k A @ 600 V	300k A @ 600 V

\*  $I^2t$  values for fuses without trip-indicator.

Minimum operating voltage for the trip-indicator : 20 V

See Fuse Blocks and Fuse Holders section and Medium Voltage fuse clips

# Semiconductor Fuses

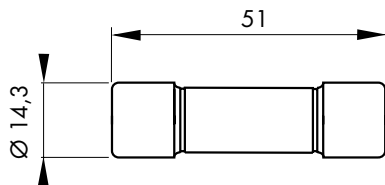


European Fuses

## French Ferrule

## 6.900-6.921 cp gRC-URC

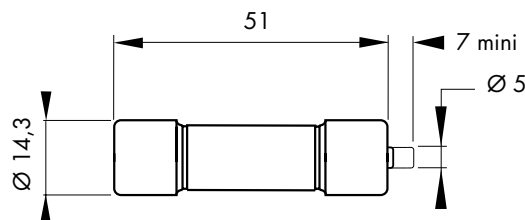
### 14 X 51 WITHOUT TRIP-INDICATOR



Weight: 18 g  
Packaging: 10 pieces

Current rating	Catalog number	Ref. number
1	6,900 Cp gRC 14.51 1	E 221080
2	6,900 Cp gRC 14.51 2	H 081473
4	6,900 Cp gRC 14.51 4	J 081474
6	6,900 Cp gRC 14.51 6	T 220909
8	6,900 Cp gRC 14.51 8	S 220908
10	6,900 Cp gRC 14.51 10	R 220907
12	6,900 Cp gRC 14.51 12	Q 220906
16	6,900 Cp gRC 14.51 16	P 220905
20	6,900 Cp gRC 14.51 20	E 220735
25	6,900 Cp gRC 14.51 25	N 220904
32	6,900 Cp gRC 14.51 32	W 220819
40	6,900 Cp gRC 14.51 40	M 220903
50	6,900 Cp gRC 14.51 50	L 220902

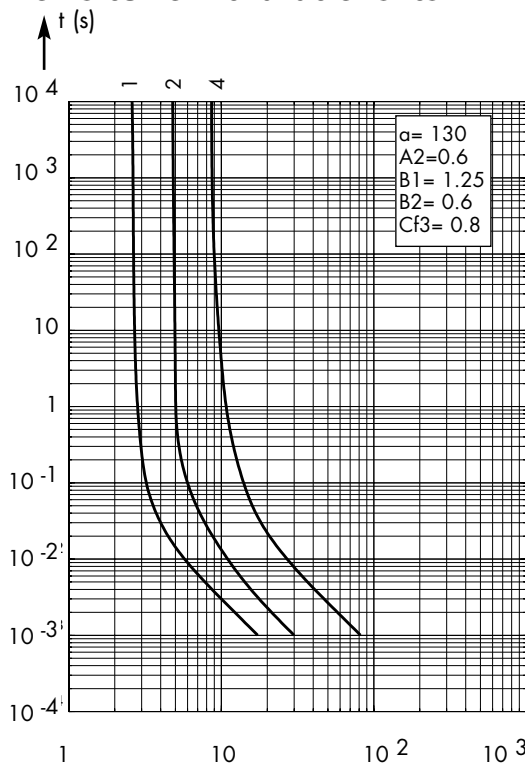
### 14 X 51 WITH TRIP-INDICATOR



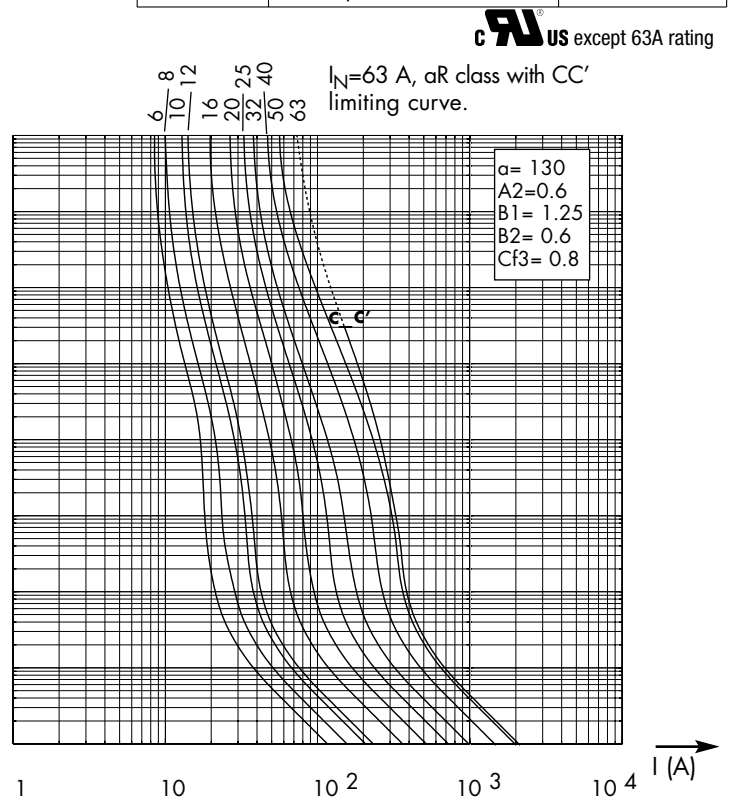
Weight: 18 g  
Packaging: 10 pieces

1	6,921 Cp gRC 14.51 1	F 221081
2	6,921 Cp gRC 14.51 2	L 081476
4	6,921 Cp gRC 14.51 4	F 081517
6	6,921 Cp gRC 14.51 6	B 220939
8	6,921 Cp gRC 14.51 8	A 220938
10	6,921 Cp gRC 14.51 10	Z 220937
12	6,921 Cp gRC 14.51 12	Y 220936
16	6,921 Cp gRC 14.51 16	X 220935
20	6,921 Cp gRC 14.51 20	W 220934
25	6,921 Cp gRC 14.51 25	V 220933
32	6,921 Cp gRC 14.51 32	V 220818
40	6,921 Cp gRC 14.51 40	M 220949
50	6,921 Cp gRC 14.51 50	N 220950
63	621 Cp URC 14.51 63	V 220910

### Time vs current characteristics



These curves indicate, for each rated current, pre-arcing time vs. R.M.S. pre-arcing current



Tolerance for mean pre-arcing current  
± 10% for current rating 1, 2, 4 A  
± 8% for current rating 6 to 63 A

# Semiconductor Fuses

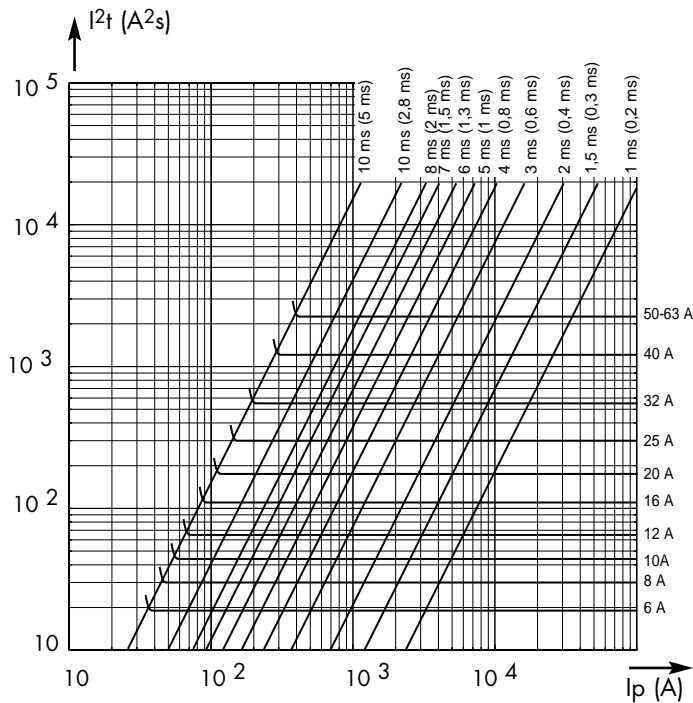


European Fuses

## French Ferrule

## 6.900-6.921 cp gRC-URC

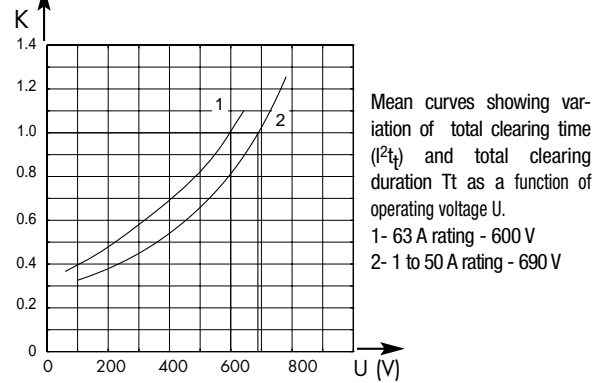
### Total clearing $I^2t$



Horizontal curves show maximum values of total clearing  $I^2t$  ( $I^2t_t$ ) for each rated current as a function of prospective current  $I_p$  @ 690 V.  $\cos\phi = 0.15$  (for 63 A @ 600 V.  $\cos\phi = 0.15$ ).

Oblique lines indicate total clearing duration  $T_t$ , with associated pre-arcing duration in brackets.

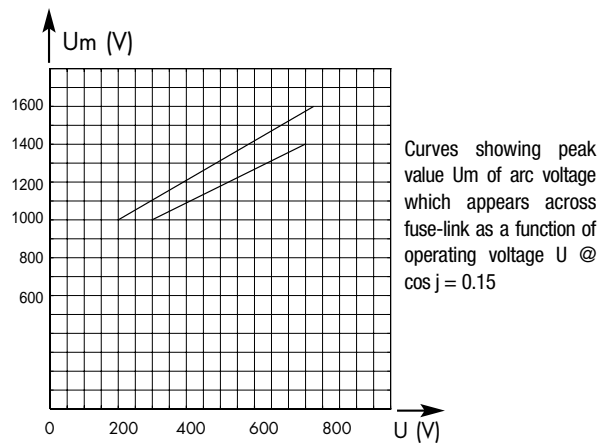
### $I^2t$ corrective factor



Mean curves showing variation of total clearing time ( $I^2t_t$ ) and total clearing duration  $T_t$  as a function of operating voltage  $U$ .

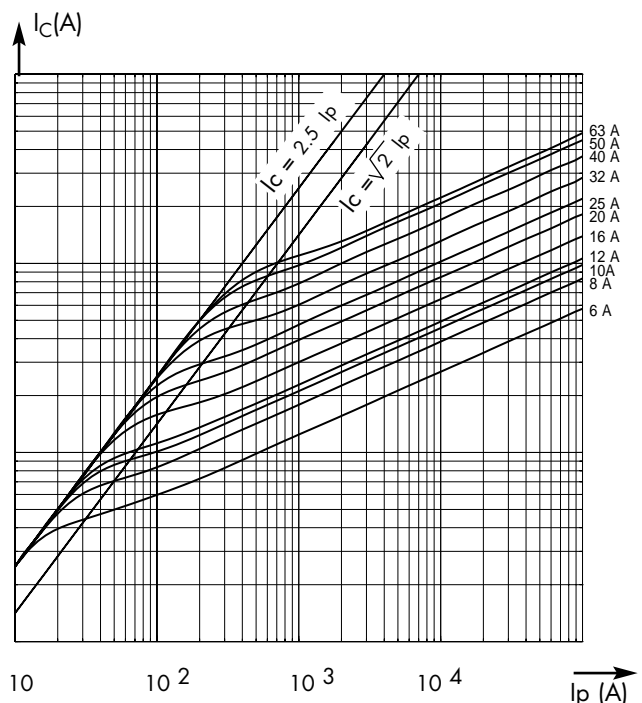
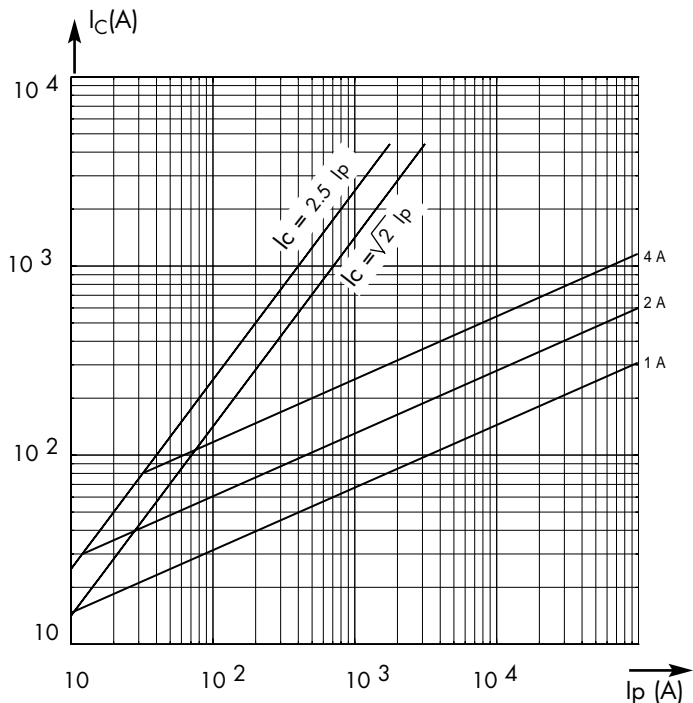
1- 63 A rating - 600 V  
2- 1 to 50 A rating - 690 V

### Peak arc voltage



Curves showing peak value  $U_m$  of arc voltage which appears across fuse-link as a function of operating voltage  $U$  @  $\cos j = 0.15$

### Current limitation curves



Curves show, for each rating, value of peak letthrough current  $I_C$  as a function of available fault current  $I_p$ .

# Semiconductor Fuses

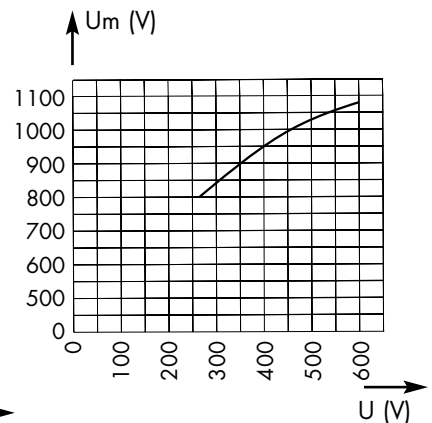
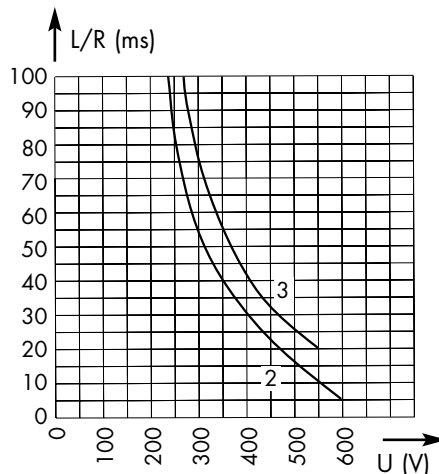
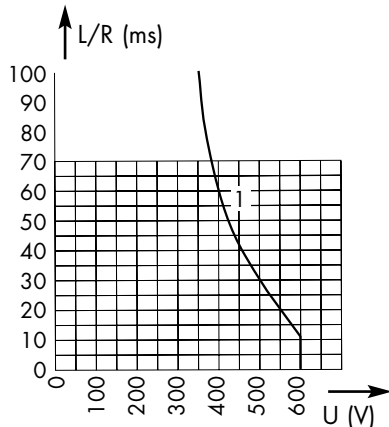


European Fuses

## French Ferrule

## 6.900-6.921 cp gRC-URC

### DC Application data



Above, left and center: Curves indicate the permissible value of time constant  $L/R$  as a function of DC working voltage:

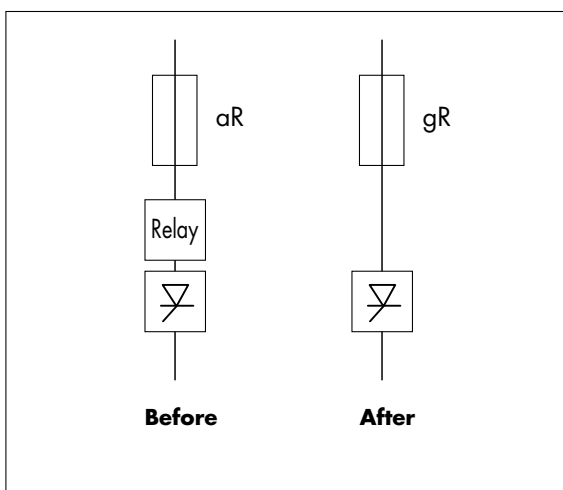
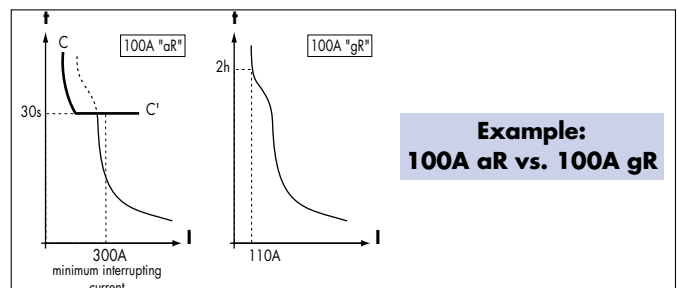
- 1- For rating 1, 2 and 4 A (gRC)  $I_p = 1,6 I_N$
- 2-  $I_p = 1,6 I_N$  for gRC only (rating 6 to 50 A)
- 3-  $I_p = 2,5 I_N$  for gRC and URC (rating 6 to 63 A)

Above, right: Curve indicates peak arc voltage  $U_m$  which may appear across fuse terminals at working voltage  $U$ .

## NEW gR-CLASS

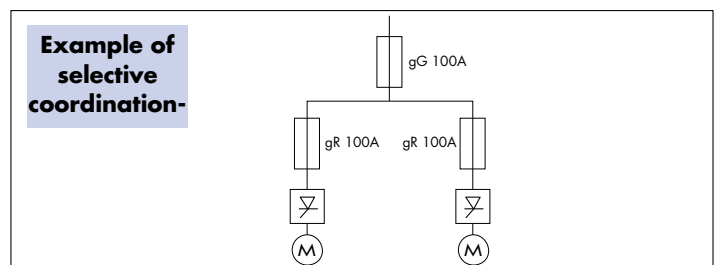
### OPTIMAL PROTECTION OF POWER EQUIPMENT

Thanks to recent technological developments, Ferraz Shawmut today markets gR-class PROTISTOR® fuses capable of clearing all types of overloads, from low multiples of current ratings up to very high short-circuit currents. Enhanced performance enables these fuses to provide solutions to many previously unsolved problems in power electronics: protection of cables without the use of additional components, protection of equipment from fire hazards, selective coordination of different fuses within a single power distribution installation...



### SELECTIVE COORDINATION

gR-class semiconductor fuses can be utilized in association with gI and gG-class low voltage power distribution fuses of the same current rating, installed upstream. In a "selectively coordinated" distribution installation, melting is limited to the fuse associated with the faulted circuit, while upstream fuses remain intact. This prevents unnecessary down-time due to power blackouts in non-faulted branches.



### aR-CLASS vs. gR-CLASS

aR-class fuses feature a high minimum interrupting current as compared with their current rating. The primary time-current characteristic of aR-class fuses is the CC' curve, above which another protection device must be associated. The gR-class fuse represents considerably improved performance in semiconductor protection.

### FERRAZ SHAWMUT EXPERTISE

gR-class fuses should be used in the design of low voltage equipment and in the protection of power electronics equipment. Designers can often substitute a gR-class fuse for an aR-class fuse (10x38, 14x51, 22x58, PSC 000 and 17x49 DIN80 or BS 88-4) but the reverse is not true: an aR fuse can never replace a gR fuse. Start protecting your new equipment with gR-class fuses today. The application of gR class fuses, with current ratings less than 100 Amps, offers enhanced protection, safety and reliability, along with reduced risk of replacement errors and assembly costs.



# Semiconductor Fuses




European Fuses

## French Ferrule

## 6.900-6.921 cp gRC-URD

600 - 690 V ~  
gRC - URD from 20 to 135 A  
Size: 22 x 58

- ▶ EXTREMELY HIGH INTERRUPTING RATING FUSES:  
PROTECTION OF SEMICONDUCTORS  
IN COMPLIANCE WITH IEC STANDARD 269.1 AND 4
- ▶ 690 V VOLTAGE RATING (CURRENT RATING 20 TO 100 A)  
AS PER IEC 33
- ▶ gR CLASS (CURRENT RATING 20 TO 100 A) ACCORDING TO  
VDE 636-23
  - CLEARING ALL OVERLOADS
  - IMPROVED SAFETY AND PROTECTION
  - ENABLING SELECTIVE COORDINATION AMONG ALL  
DISTRIBUTION CIRCUIT FUSES
- ▶ aR CLASS (CURRENT RATING 125 AND 135 A) AS PER VDE 636-23  
AND IEC 269.4
- ▶ TWO MODELS COMPLYING WITH NF C 63210 AND 63211  
WITH OR WITHOUT TRIP-INDICATOR
- ▶ gRC FUSES ARE 700VAC-DC UL RECOGNIZED 



### MAIN CHARACTERISTICS

Voltage rating $U_N$ (V)	Class	Current rating $I_N$ (A)	Pre-arcing $I^2t_p$ @ 1 ms (A <sup>2</sup> s)	Total clearing $I^2t_t$ @ $U_N$ (A <sup>2</sup> s)	Watts loss		Tested interrupting rating	Estimated interrupting rating
					$0.8 I_N$	$I_N$		
690	gRC	20	17	125	4.0	6.5	100k A @ 690 V	300k A @ 690 V
		25	39	280	4.5	7.5		
		32	72	490	5.0	9.0		
		40	118	785	5.5	10		
		50	242	1390	7.0	11.5		
		63	430	2460	8.0	13.5		
		80	970	5565	9.0	15.5		
		100	2080	11950	10	17		
600	URD	125	2900	14000	14	22	100k A @ 600 V	300k A @ 600 V
		135	3360	17700	15	25		

Minimum operating voltage for the trip-indicator: 20 V

See Fuse Blocks and Fuse Holders section and Medium Voltage fuse clips

# Semiconductor Fuses

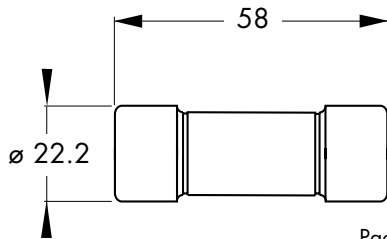


European Fuses

## French Ferrule

## 6.900-6.921 cp gRC-URD

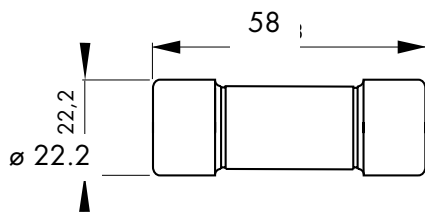
### 22 X 58 WITHOUT TRIP-INDICATOR



Weight: 57 g  
Packaging: 10 pieces

Current rating	Catalog Number	Ref. Number
20	6,900 CP gRC 22.58 20	C 220940
25	6,900 CP gRC 22.58 25	B 220916
32	6,900 CP gRC 22.58 32	A 220915
40	6,900 CP gRC 22.58 40	Z 220914
50	6,900 CP gRC 22.58 50	Y 220913
63	6,900 CP gRC 22.58 63	X 220912
80	6,900 CP gRC 22.58 80	Y 220821
100	6,900 CP gRC 22.58 100	W 220911

### 22 X 58 WITH TRIP-INDICATOR



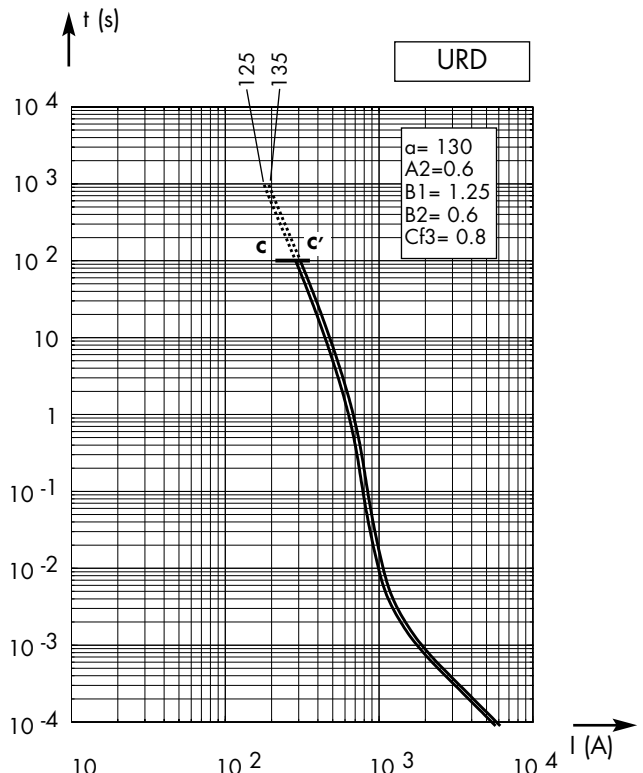
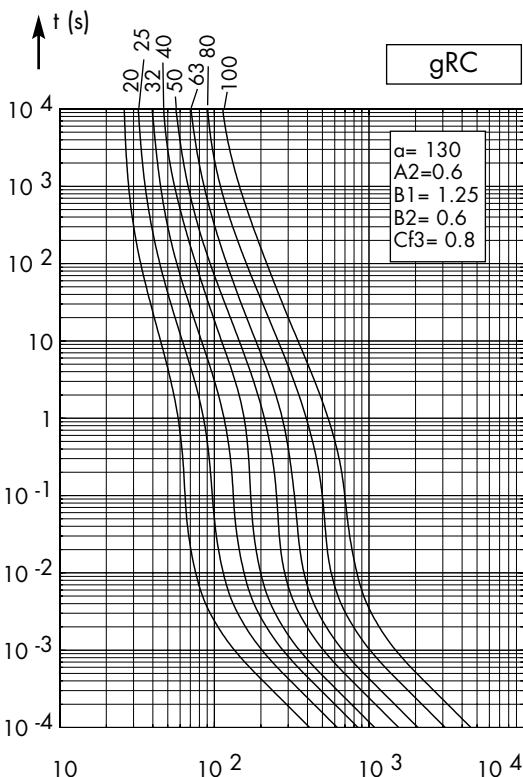
Weight: 57 g  
Packaging: 10 pieces

Current rating	Catalog Number	Ref. Number
20	6,921 CP gRC 22.58 20	D 220734
25	6,921 CP gRC 22.58 25	G 220921
32	6,921 CP gRC 22.58 32	F 220920
40	6,921 CP gRC 22.58 40	E 220919
50	6,921 CP gRC 22.58 50	D 220918
63	6,921 CP gRC 22.58 63	C 220733
80	6,921 CP gRC 22.58 80	X 220820
100	6,921 CP gRC 22.58 100	C 220917
125	621 CP URD 22.58 125	A 220708
135	621 CP URD 22.58 135	B 220709

US except 125 and 135A rating

## ELECTRICAL CHARACTERISTICS

### Time vs current characteristics



These curves indicate, for each rated current, pre-arcing time vs. R.M.S. pre-arcing current

Tolerance for mean pre-arcing current  
± 9% for all current ratings

# Semiconductor Fuses

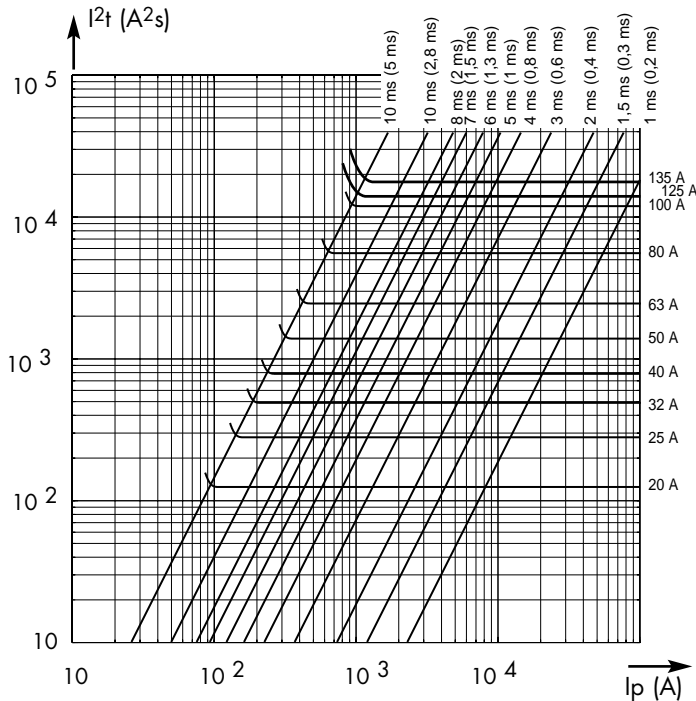


European Fuses

## French Ferrule

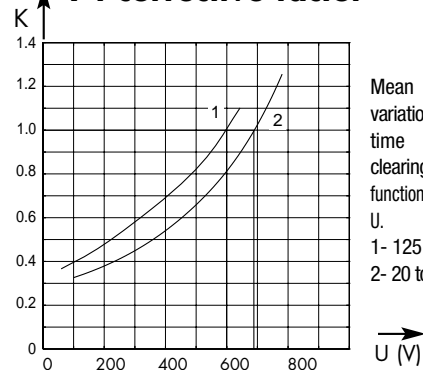
## 6.900-6.921 cp gRC-URD

### Total clearing $I^2t$



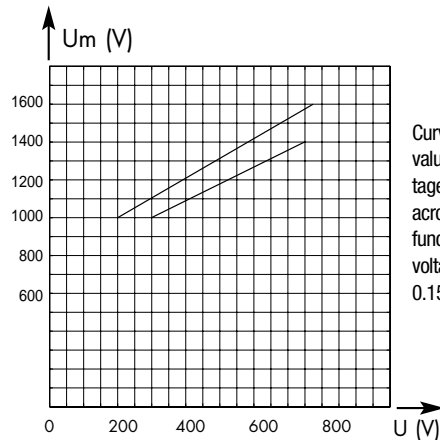
Above: Horizontal curves show, for each rated current, maximum values of total clearing  $I^2t$  ( $I^2t_t$ ) as a function of prospective current  $I_p$  @ 690 V.  $\cos\phi = 0.15$  (125-135 A @ 600 V.  $\cos\phi = 0.15$ )  
Oblique lines indicate total clearing duration  $T_t$  with associated pre-arcing duration in brackets.

### $I^2t$ corrective factor



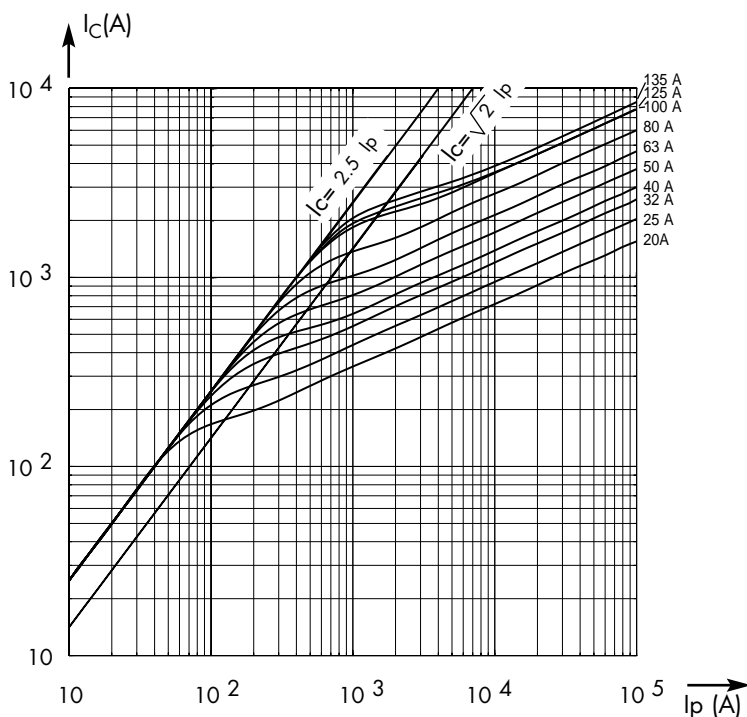
Mean curves showing variation of total clearing time ( $I^2t_t$ ) and total clearing duration  $T_t$  as a function of operating voltage  $U$ .  
1- 125 and 135 A rating  
2- 20 to 100 A rating

### Peak arc voltage



Curve showing peak value  $U_m$  of arc voltage which appears across fuse-link as a function of operating voltage  $U$  @  $\cos j = 0.15$

### Current limitation curves



Left: Curves show value of peak letthrough current  $I_c$  as a function of the available fault current  $I_p$ .

# Semiconductor Fuses

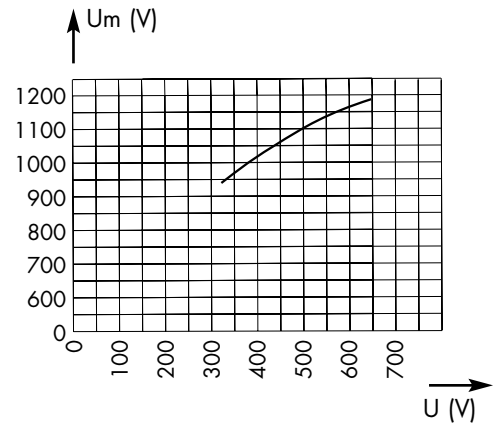
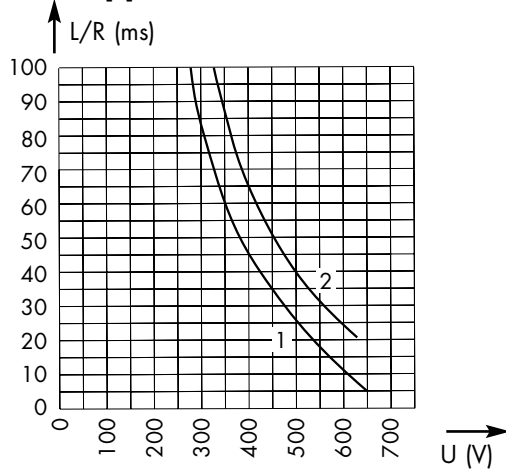


European Fuses

## French Ferrule

## 6.900-6.921 cp gRC-URD

### DC Application data

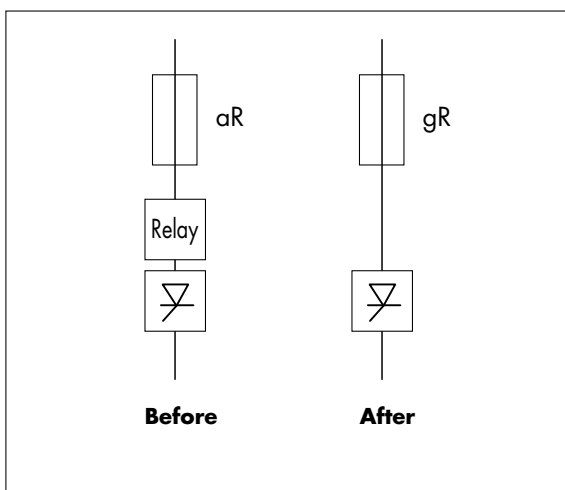
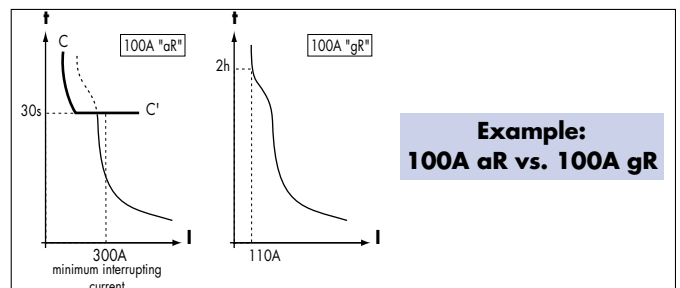


Above: Curve indicates peak arc voltage  $U_m$  which may appear across fuse terminals at working voltage  $U$ .

## NEW gR-CLASS

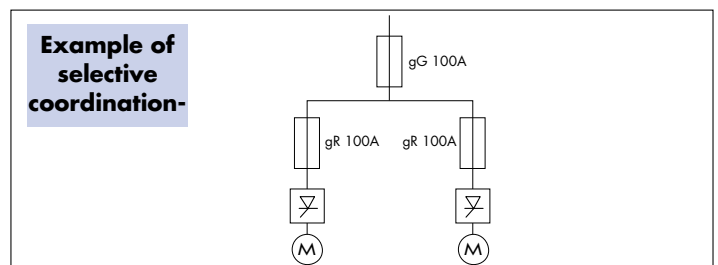
### OPTIMAL PROTECTION OF POWER EQUIPMENT

Thanks to recent technological developments, Ferraz Shawmut today markets gR-class PROTISTOR® fuses capable of clearing all types of overloads, from low multiples of current ratings up to very high short-circuit currents. Enhanced performance enables these fuses to provide solutions to many previously unsolved problems in power electronics: protection of cables without the use of additional components, protection of equipment from fire hazards, selective coordination of different fuses within a single power distribution installation...



### SELECTIVE COORDINATION

gR-class semiconductor fuses can be utilized in association with gI and gG-class low voltage power distribution fuses of the same current rating, installed upstream. In a "selectively coordinated" distribution installation, melting is limited to the fuse associated with the faulted circuit, while upstream fuses remain intact. This prevents unnecessary down-time due to power blackouts in non-faulted branches.



### aR-CLASS vs. gR-CLASS

aR-class fuses feature a high minimum interrupting current as compared with their current rating. The primary time-current characteristic of aR-class fuses is the CC' curve, above which another protection device must be associated. The gR-class fuse represents considerably improved performance in semiconductor protection.

### FERRAZ SHAWMUT EXPERTISE

gR-class fuses should be used in the design of low voltage equipment and in the protection of power electronics equipment. Designers can often substitute a gR-class fuse for an aR-class fuse (10x38, 14x51, 22x58, PSC 000 and 17x49 DIN80 or BS 88-4) but the reverse is not true: an aR fuse can never replace a gR fuse. Start protecting your new equipment with gR-class fuses today. The application of gR class fuses, with current ratings less than 100 Amps, offers enhanced protection, safety and reliability, along with reduced risk of replacement errors and assembly costs.

# Semiconductor Fuses



European Fuses

## French Ferrule

## 621-6.621cp URGD

600 V - 660 V AC

URGD - from 63 up to 250A

Size: 27x60

- EXTREMELY HIGH INTERRUPTING RATING FUSES:  
PROTECTION OF POWER SEMICONDUCTORS ACCORDING  
TO IEC STANDARD 269.1 AND 4
- 600 V - 660 V AC VOLTAGE RATING
- aR- CLASS ACCORDING TO VDE 636-23 AND IEC 269.4



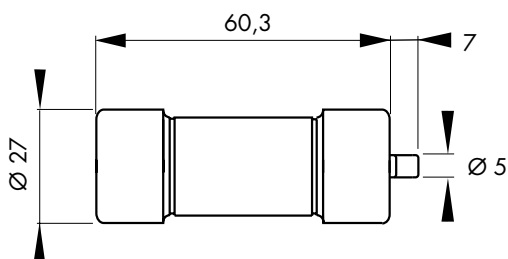
### MAIN CHARACTERISTICS

Voltage rating $U_N$ ( VAC )	Class	Current rating $I_N$ ( A )	Pre-arcing $I^2_t @ 1 \text{ ms}$ $I^2_t_p$ ( A <sup>2</sup> s )	Total clearing $I^2_t @ U_N$ $I^2_t$ ( A <sup>2</sup> s )	Watts loss		Tested interrupting rating
					$0.8 I_N$	$I_N$	
660 V	URGD	63	405	1840	12	22	200 kA @ 660 V
		80	860	3750	13.5	24.6	
		100	1620	6800	15	27	
		125	3425	13600	16	29.5	
		160	6480	24600	17	32.5	
		200	13700	61500	18.5	35.7	
600 V	URGD	250	29600	107000	21	40	200 kA @ 600 V

Minimum operating voltage for trip-indicator: 20 V

### Ref. Numbers

#### 27x60 - With blown fuse trip-indicator



Type	Voltage	Current rating	Catalog Number	Ref. Number
URGD	660 V	63 A	6.621 CP URGD 27x60/ 63	A076820
		80 A	6.621 CP URGD 27x60/ 80	B076821
		100 A	6.621 CP URGD 27x60/100	C076822
		125 A	6.621 CP URGD 27x60/125	D076823
		160 A	6.621 CP URGD 27x60/160	E076824
		200 A	6.621 CP URGD 27x60/200	F076825
URGD	600 V	250 A	621 CP URGD 27x60/250	W076264

See Fuse Blocks and Fuse Holders section and Medium Voltage Fuse Clips

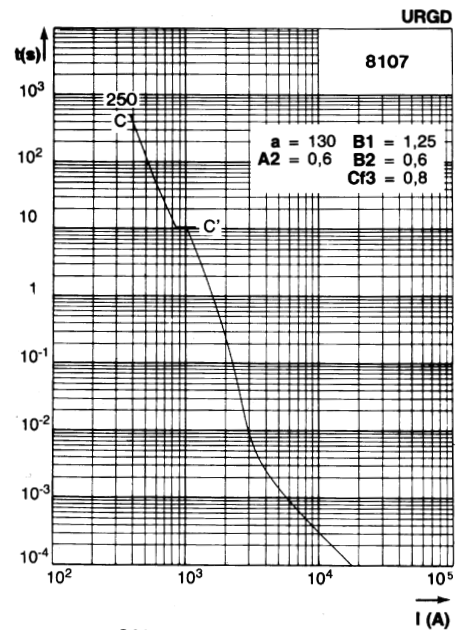
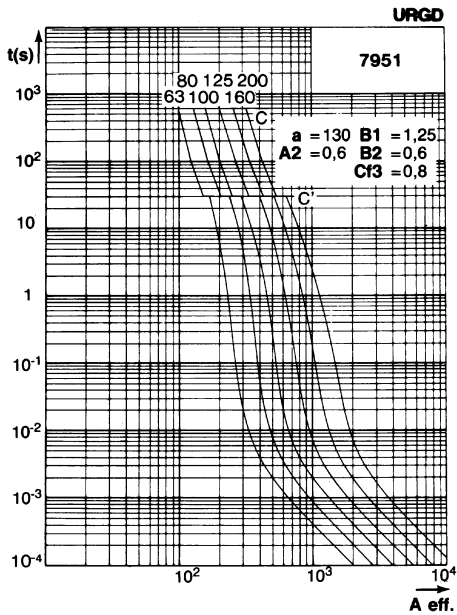
# Semiconductor Fuses

European Fuses

French Ferrule

621-6.621cp URGD

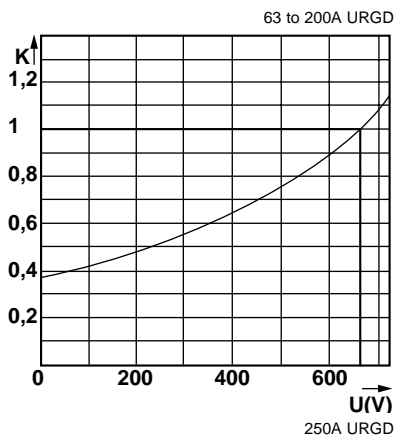
## Time vs current characteristics



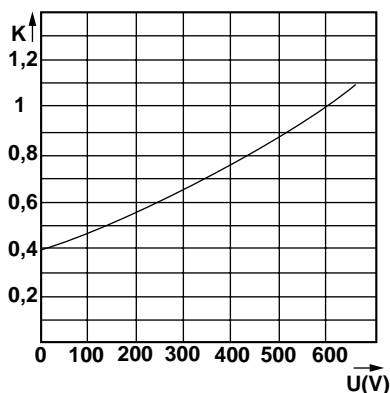
Tolerance for mean pre-arcing current  $\pm 8\%$

These curves indicate, for each rated current, pre-arcing time vs. R.M.S. pre-arcing current.

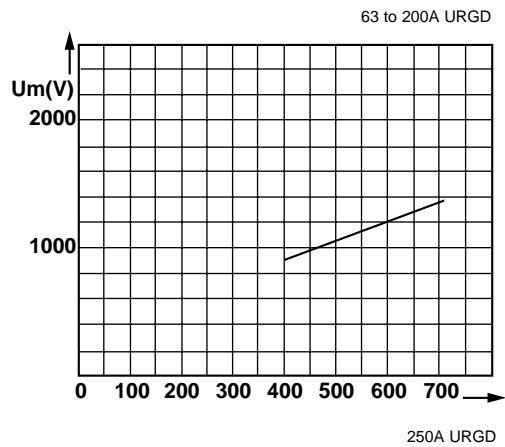
## Corrective factor



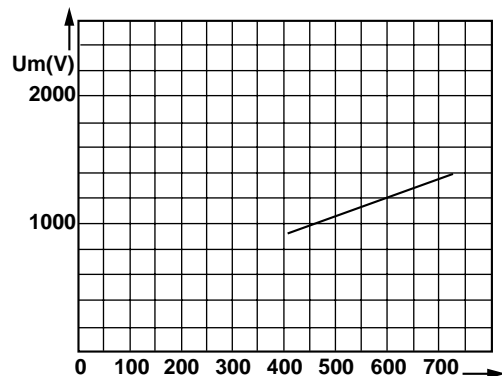
Left: Mean curves showing variation of total clearing time ( $I^2t_t$ ) and the total clearing duration  $t_t$  as a function of the operating voltage U.



## Peak arc voltage



Left: Curves show peak value  $U_m$  of arc voltage which appears across the fuse-link as a function of operating voltage U @  $\cos \varphi = 0.15$ .




# Semiconductor Fuses



## French Ferrule **6.621cp URQ URS - 1021cp URQ**

660 V - 1000 V AC  
 URB - URQ - URS from 32 to 250 A  
 Size: 27x60

- EXTREMELY HIGH INTERRUPTING RATING FUSES:  
 PROTECTION OF POWER SEMI CONDUCTORS ACCORDING  
 TO IEC STANDARD 269.1 AND 4
- 660 V - 1000 V AC VOLTAGE RATING
- aR-CLASS ACCORDING TO VDE 636-23 AND IEC 269.4
- 660V URQ and 1000V URB are UL RECOGNIZED 



### MAIN CHARACTERISTICS

Voltage rating $U_N$ (VAC)	Class	Current rating $I_N$ (A)	Pre-arcing $I^2t @ 1 \text{ ms}$ $I^2t_p$ (A <sup>2</sup> s)	Total clearing $I^2t @ U_N$ $I^2t_f$ (A <sup>2</sup> s)	Watts loss		Tested interrupting rating
					0,8 $I_N$	$I_N$	
660 V	URQ	50	110	610	8.4	16	200 kA @ 660 V
		63	155	860	11.1	21	
		80	350	1880	12.6	24	
		100	625	3210	14.2	27	
		125	1400	6970	15.7	30	
		160	3150	15000	17.7	34	
		200	6580	30000	19.4	38	
		250	15570	63000	22.6	45	
	URS	125	2790	13000	14.5	25	
		160	5500	24000	17.5	30	
1000 V	URB	32	33	250	7.4	14.5	100 kA @ 1000 V
		40	60	450	8.7	17	
		50	110	840	9.7	19	
		63	200	1470	11.3	22	
		80	435	3300	12.3	24	
		100	975	6000	14	27	
		125	1910	12500	16	31	
		160	3890	26700	18	35	
		170	4710	36000	19	37	

\* Minimum operating voltage for trip-indicator: 20 V

# Semiconductor Fuses

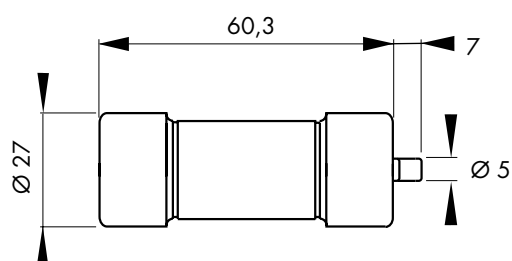
 European Fuses

## French Ferrule 6.621cp URQ-URS - 1021cp URB



Except 125 and 160A URS

### 27x60 - With blown fuse trip-indicator



Type	Voltage	Current rating	Catalog Number	Ref. Number
URQ	660 V	50 A	6.621 CP URQ 27x60/ 50	N075958
		63 A	6.621 CP URQ 27x60/ 63	V076309
		80 A	6.621 CP URQ 27x60/ 80	W076310
		100 A	6.621 CP URQ 27x60/100	R078330
		125 A	6.621 CP URQ 27x60/125	S078331
		160 A	6.621 CP URQ 27x60/160	X076311
		200 A	6.621 CP URQ 27x60/200	T078332
		250 A	6.621 CP URQ 27x60/250	T076308
URS	660 V	125 A	6.621 CP URS 27x60/125	P209865
		160 A	6.621 CP URS 27x60/160	Q209866
URB	1000 V	32 A	1021 CP URB 27x60/ 32	S081298
		40 A	1021 CP URB 27x60/ 40	R081297
		50 A	1021 CP URB 27x60/ 50	Q081296
		63 A	1021 CP URB 27x60/ 63	P081295
		80 A	1021 CP URB 27x60/ 80	N081294
		100 A	1021 CP URB 27x60/100	M081293
		125 A	1021 CP URB 27x60/125	L081292
		160 A	1021 CP URB 27x60/160	K081291
		170 A	1021 CP URB 27x60/170	Z080338

See Fuse Blocks and Fuse Holders section and Medium Voltage fuse clips



# Semiconductor Fuses

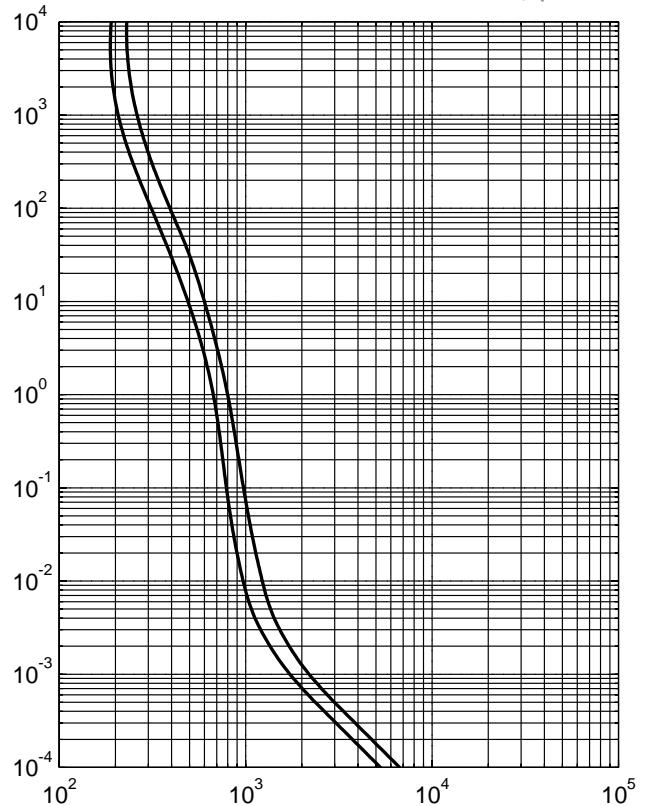
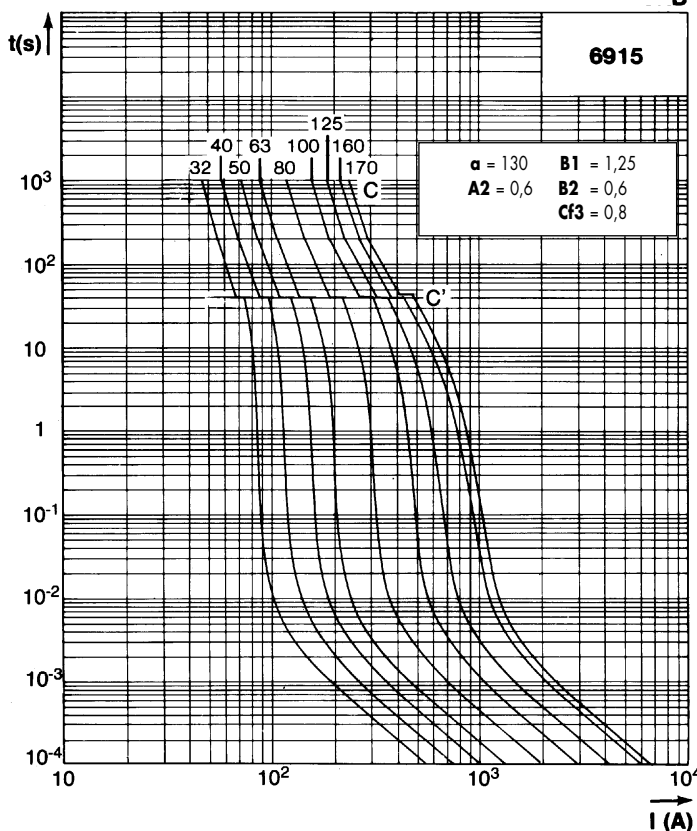
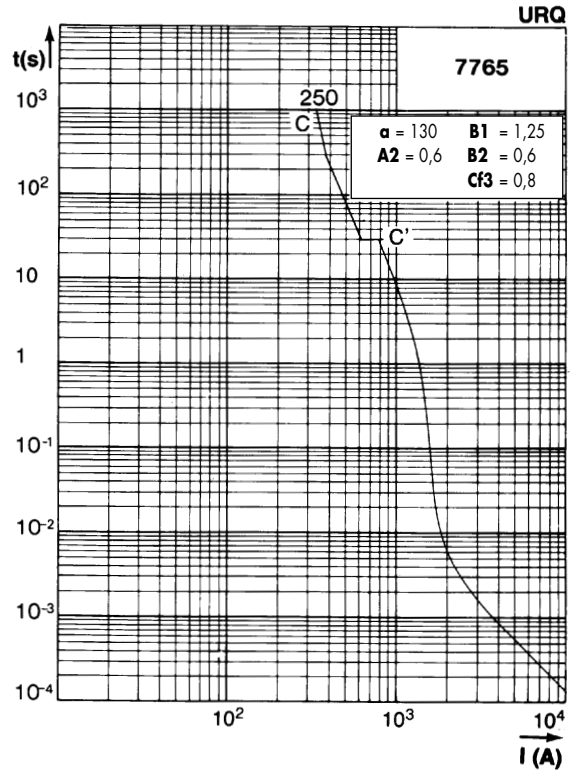
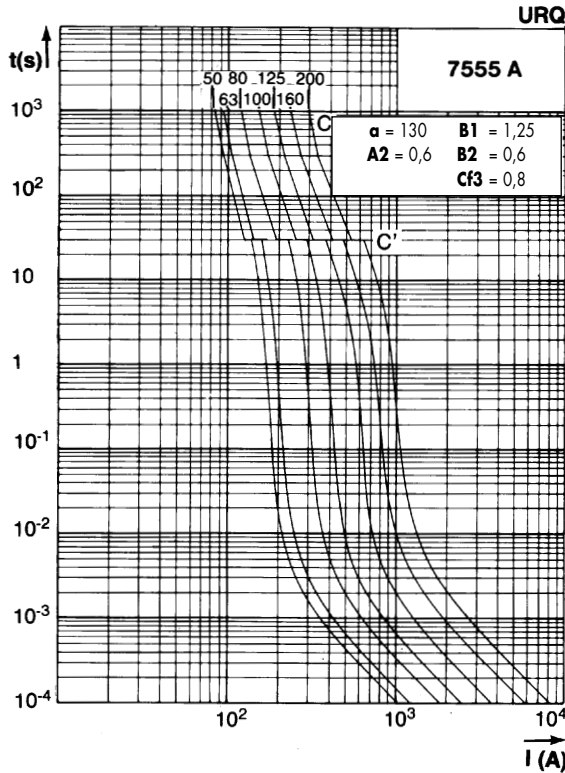


European Fuses

French Ferrule

6.621cp URQ - 1021cp URB

## Time vs current characteristics



These curves indicate, for each rated current, pre-arcing time vs. R.M.S. pre-arcing current.

**Tolerance for mean pre-arcing current  $\pm 8\%$ .**

# Semiconductor Fuses

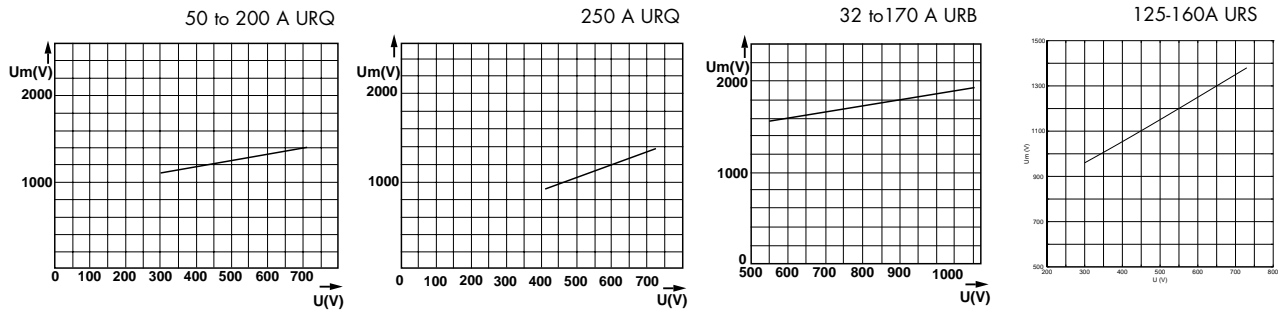


European Fuses

French Ferrule

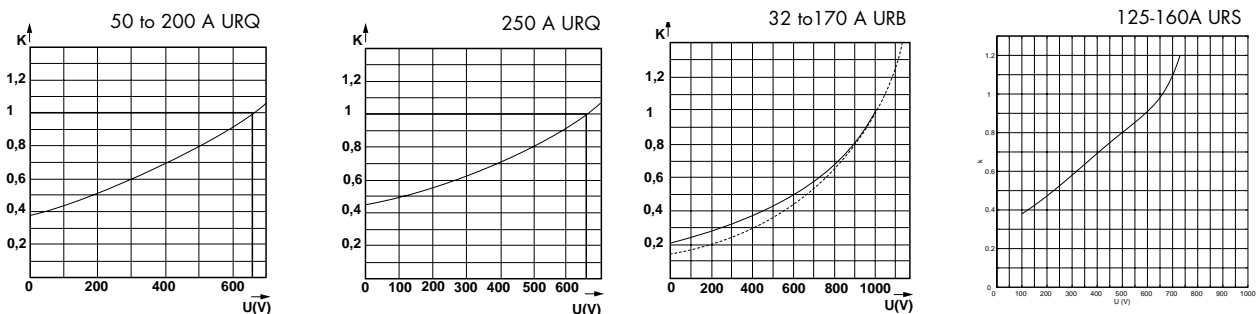
6.621cp URQ - 1021cp URB

## Peak arc voltage



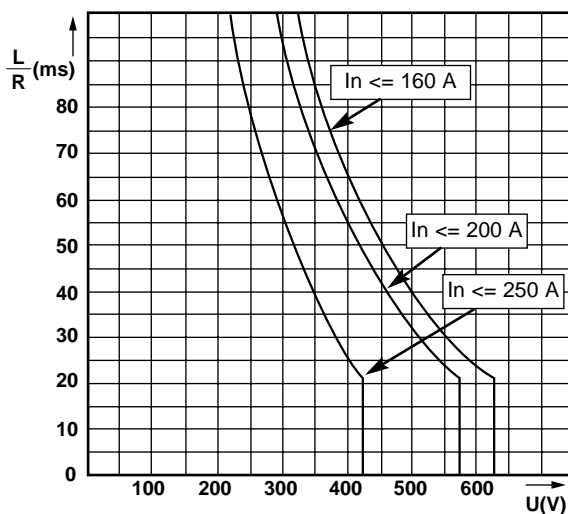
These curves show peak value  $U_m$  of arc voltage which appears across the fuse-link as a function of operating voltage  $U$  @  $\cos \varphi = 0.15$ .

## Corrective factor



Above: Mean curves show variation of total clearing time ( $I^2t_f$ ) and total clearing duration  $t_f$  as a function of operating voltage  $U$ .

## DC Application data



Left: Curves indicate permissible value of time constant  $L/R$  as a function of the DC working voltage