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### Ferrule fuse ranges

Volts	Amps	AC	DC
150	5-60	X	X
250	1-50	X	X
500	0.25-30	X	X
600	6-32	X	X
700 (22 x 58mm)	20-100	X	—
700 (14 x 51mm)	1-50	X	X
750	5-60	X	X
1000	20-30	X	X (800Vdc)
1250	20-30	X	X (1000Vdc)
1500	8-15	X	X (1000Vdc)
2000	2-6	X	X (1000Vdc)

### General information

Eaton offers a full line of ferrule style (cylindrical clip-mounted) fuses, designed and tested to meet standards and requirements in various locations around the world. Their unique design and construction provide:

- Superior cycling capability
- Low energy let-through ( $I^2t$ )

Ferrule fuses provide an excellent solution for small UPS, small AC drives and other low power applications where space is at a premium.

### Voltage rating

All Bussmann series ferrule fuses — except 690V — have been tested at their rated voltage. The 690V ferrule fuse has been tested to the IEC 60269 standard, which requires clearing at the rated voltage +5%.

### Accessories

Ferrule fuses may be mounted in fuseclips, fuse holders, fuse blocks or fused switches. A variety of products are available. Please consult Eaton Application Engineering to discuss your requirement.

# 6

## High speed fuses

Ferrule

### FWA 150V: 5-30A (10 x 38mm) 35-60A (21 X 51mm)

#### Specifications

**Description:** Ferrule style high speed fuses.

**Dimensions:** See dimensions illustration.

#### Ratings:

Volts: — 150Vac/dc

Amps: — 5-60A

IR: — 100kA Sym.

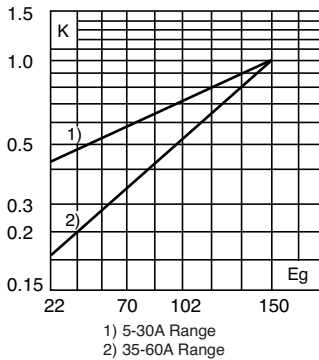
**Agency information:** CE, UL Recognized JFHR2.E91958.



#### Electrical characteristics

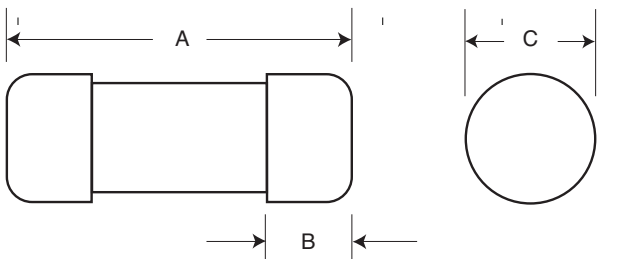
##### Total clearing I<sup>2</sup>t

The total clearing I<sup>2</sup>t at rated voltage and at power factor of 15% are given in the electrical characteristics. For other voltages, the clearing I<sup>2</sup>t is found by multiplying by correction factor, K, given as a function of applied working voltage, E<sub>g</sub>, (rms).



##### Dimensions - in (mm)

Amp range	Dimensions		
	A	B	C
5-30	1.5 (38.1)	0.375 (9.5)	0.406 (10.3)
35-60	2.0 (50.8)	0.625 (15.9)	0.811 (20.6)



#### Recommended fuse blocks and holders

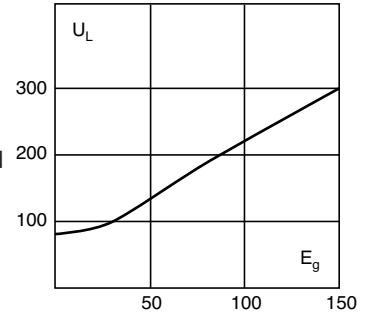
Catalog number	Fuse holder	Fuse block
FWA 5-30A10F	CHMxB*	BMM603xB
FWA 35-60A21F	No holder	No block
FWX 1-50A14F	CH14xB*	J70032-xCR*
FWH 0.250-030A6F	No holder	No block
FWH 1-30A14F	CH14xB*	J70032-xCR*
FWP 1-50A14F	CH14xB*	J70032-xCR*
FWP 20-100A22F	CH22xB*	J70100-xCR*
FWJ 30-30A14F	No holder	No block
FWS 2-15A20F	CH127 (Single pole only)	No block
FWL 20-30A20F	CH127 (Single pole only)	No block

\*Where x is the number of desired poles (1-, 2-, or 3-)

Data Sheet: 720003

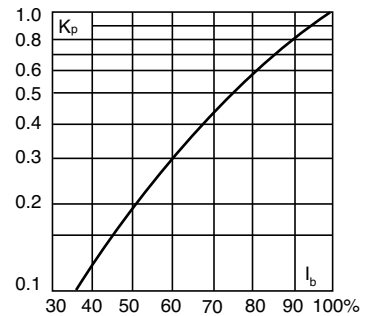
#### Arc voltage

This curve gives the peak arc voltage, U<sub>L</sub>, which may appear across the fuse during its operation as a function of the applied working voltage, E<sub>g</sub>, (rms) at a power factor of 15%.



#### Power losses

Watts loss at rated current is given in the electrical characteristics. The curve allows the calculation of the power losses at load currents lower than the rated current. The correction factor, K<sub>p</sub>, is given as a function of the RMS load current, I<sub>b</sub>, in % of the rated current.



#### Catalog numbers

Catalog numbers	Size	Electrical characteristics			
		Rated current RMS-amps	I <sup>2</sup> t (A <sup>2</sup> sec)		Watts loss
			Pre-arc	Clearing at 150V	
FWA-5A10F	10 x 38mm ( <sup>13</sup> / <sub>16</sub> " x 1½")	5	1.6	8	1
FWA-10A10F		10	3.6	16	2.7
FWA-15A10F		15	14	55	3.3
FWA-20A10F		20	33	130	3.8
FWA-25A10F		25	58	220	4.9
FWA-30A10F	30	100	400	4.9	
FWA-35A21F	21 x 51mm ( <sup>13</sup> / <sub>16</sub> " x 2")	35	75	800	4.5
FWA-40A21F		40	100	1000	5.1
FWA-45A21F		45	130	1300	6
FWA-50A21F		50	170	1600	7.3
FWA-55A21F		55	210	2100	8.0
FWA-60A21F		60	250	2400	8.0

• Watts loss provided at rated current.  
• See accessories on page 6-123.

#### Features and benefits

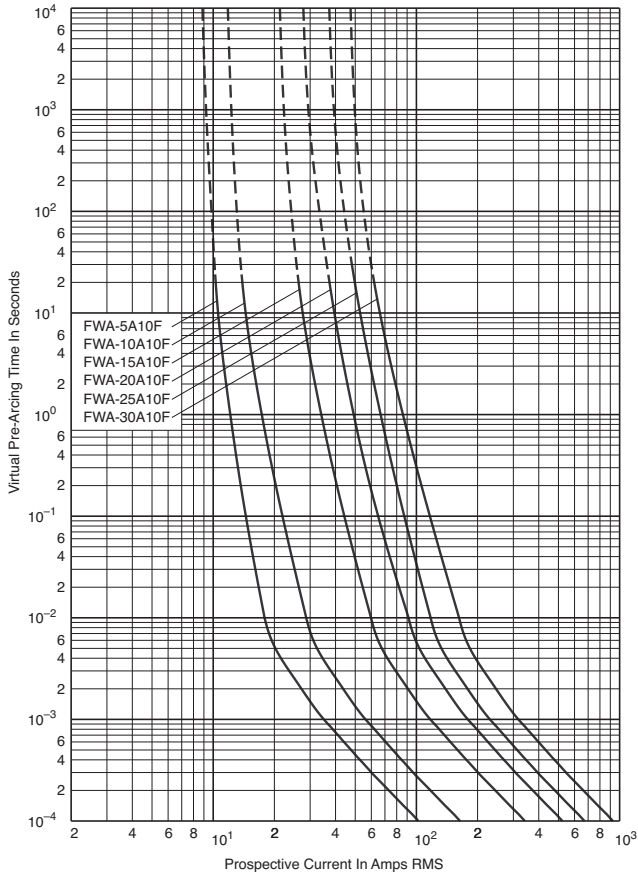
- Excellent cycling capability and DC performance
- Low arc voltage and low energy let-through (I<sup>2</sup>t)
- Low watts loss in a compact size
- Used with finger-safe holders/blocks

#### Typical applications

- DC common bus
- DC drives
- Power converters/rectifiers
- Reduced voltage starters

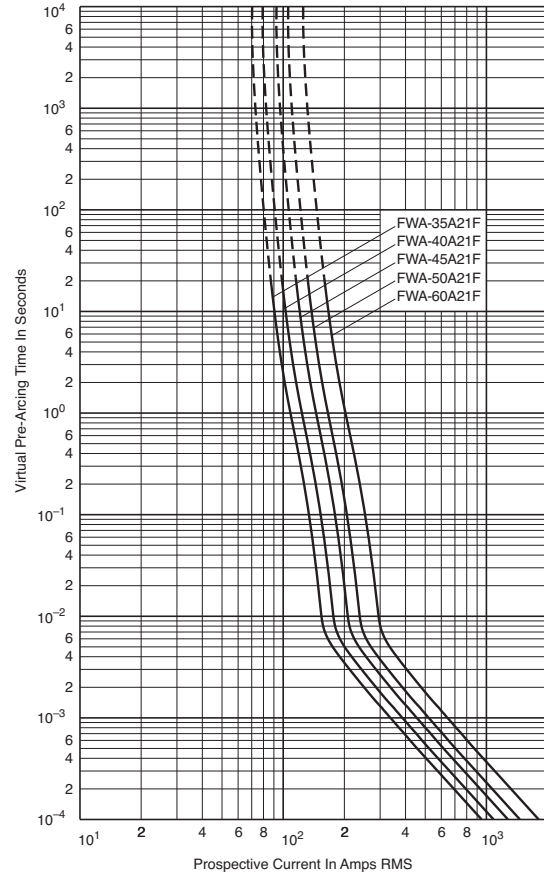
## FWA 5-30A: 150V (10 x 38mm)

Time-current curve

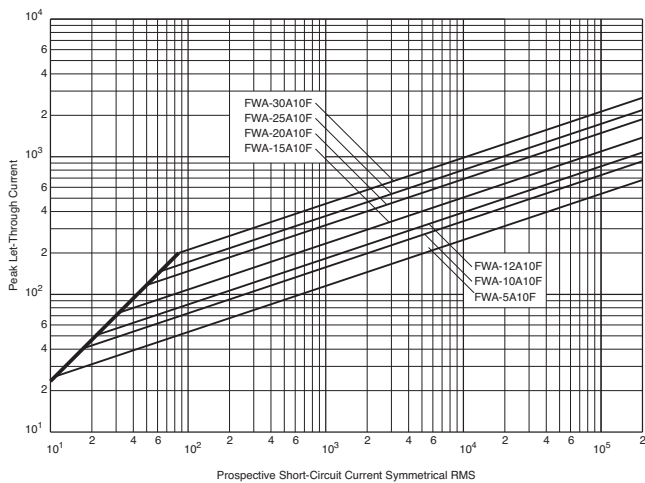


## FWA 35-60A: 150V (21 x 51mm)

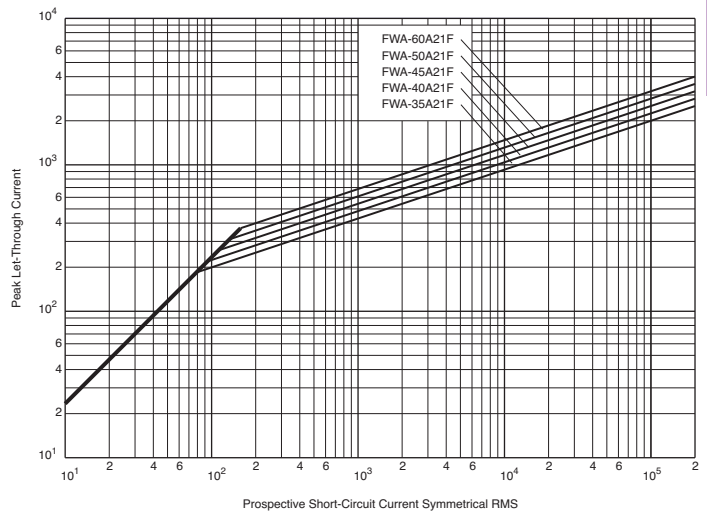
Time-current curve



Peak let-through curve



Peak let-through curve



High speed fuses

# 6

## High speed fuses

Ferrule - UL

### FWX 250V: 1-50A (14 x 51mm)

#### Specifications

**Description:** Ferrule style high speed fuses.

**Dimensions:** See dimensions illustration.

#### Ratings:

Volts: — 250Vac/dc

Amps: — 1-50A

IR: — 200kA RMS Sym.

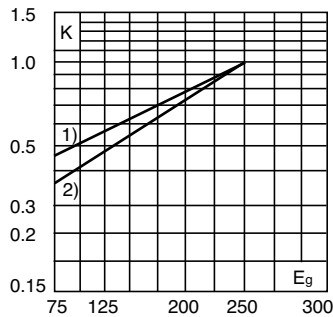
— 50kA @ 250Vdc

**Agency information:** CE, UL Recognized JFHR2.E91958 1-50A and CSA Component Acceptance file Class 1422-30, 1422-90 (53787) 5-30A.

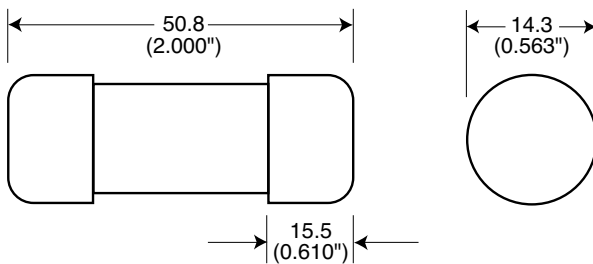
#### Electrical characteristics

##### Total clearing I<sup>2</sup>t

The total clearing I<sup>2</sup>t at rated voltage and at power factor of 15% are given in the electrical characteristics. For other voltages, the clearing I<sup>2</sup>t is found by multiplying by correction factor, K, given as a function of applied working voltage, E<sub>g</sub>, (rms).

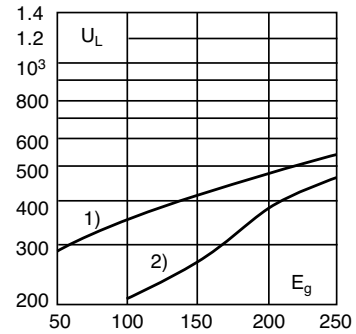


#### Dimensions - mm (in)



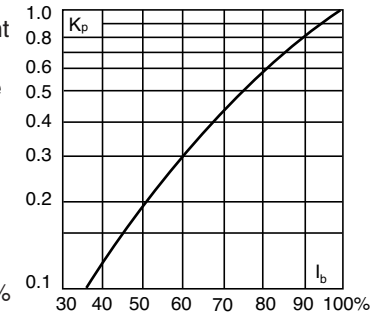
#### Arc voltage

This curve gives the peak arc voltage, U<sub>L</sub>, which may appear across the fuse during its operation as a function of the applied working voltage, E<sub>g</sub>, (rms) at a power factor of 15%.



#### Power losses

Watts loss at rated current is given in the electrical characteristics. The curve allows the calculation of the power losses at load currents lower than the rated current. The correction factor, K<sub>p</sub>, is given as a function of the RMS load current, I<sub>b</sub>, in % of the rated current.



#### Catalog numbers

Catalog number	Size	Electrical characteristics			
		Rated current RMS-amps	I <sup>2</sup> t (A <sup>2</sup> sec)		Watts loss
			Pre-arc	Clearing at 250V	
FWX-1A14F	14 x 51mm (% <sup>2</sup> x 2")	1	—	—	—
FWX-2A14F		2	—	—	—
FWX-3A14F		3	—	—	—
FWX-4A14F		4	—	—	—
FWX-5A14F		5	1.6	13	1.3
FWX-10A14F		10	3.6	24	3.4
FWX-15A14F		15	14	83	3.8
FWX-20A14F		20	33	200	4.6
FWX-25A14F		25	58	300	5.3
FWX-30A14F		30	100	500	5.9
FWX-50A14F	50	200	1800	5.7	

- Watts loss provided at rated current.
- (250Vdc/Interrupting rating 50kA) UL Recognition and CSA Component Acceptance on 5 through 30A only. Consult Eaton for additional ratings.
- See accessories on page 6-123.

#### Features and benefits

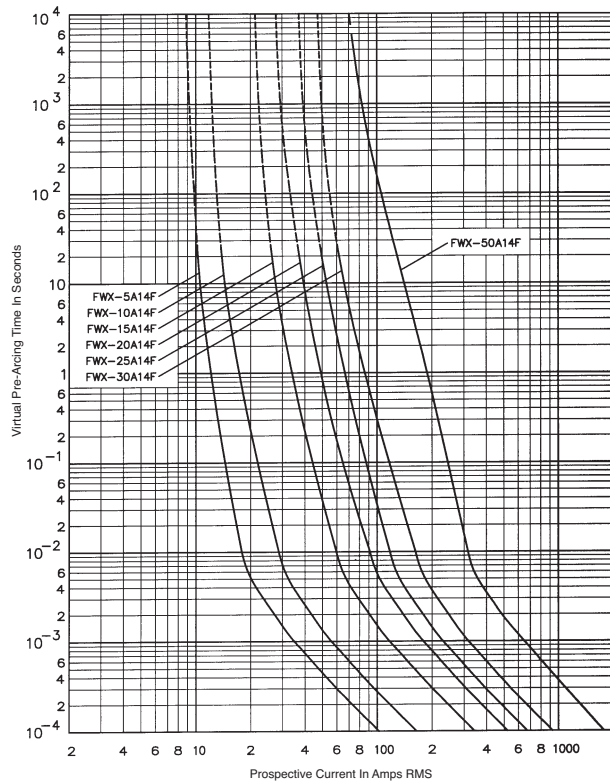
- Excellent cycling capability and DC performance
- Low arc voltage and low energy let-through (I<sup>2</sup>t)
- Low watts loss in a compact size
- Used with finger-safe holders/blocks

#### Typical applications

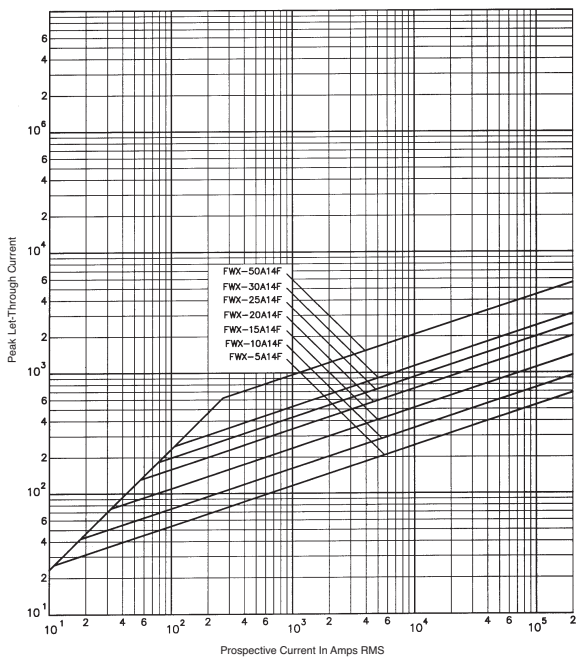
- DC common bus
- DC drives
- Power converters/rectifiers
- Reduced voltage starters

## FWX 1-30A: 250V (14 x 51mm)

Time-current curve



Peak let-through curve



High speed fuses

# 6

## High speed fuses

### Ferrule

#### Catalog symbols:

- FWH-(amp)A6F
- FWH-(amp)A6FR (RoHS compliant)
- FWH5-(amp)A6F
- FWH5-(amp)A6FR (RoHS compliant)



#### Description:

Eaton's Bussmann® series of FWH 6x32mm ferrule high speed fuses are for the protection of DC common bus, DC drives, power converters/rectifiers and reduced rated voltage starters.

#### Ratings

Volts

- 500Vac (0.25-1A and 3.15-30A)
- 1000Vac (2A)
- 600Vdc (1-5A)

Amps

- 0.25-30A

Interrupting rating

- 50kA AC (0.25-1A and 3.15-20A)
- 30kA AC (2A)
- 20kA AC (25-30A)
- 50kA DC (1-5A)

#### Opening times:

Amp range	150%	200%	300%
0.25-7A	> 30 min.	> 30 min.	≤ 10 sec.
10-30A	> 30 min.	> 30 min.	≤ 10 sec.

#### Catalog numbers:

Amps	Rated voltage		I <sup>2</sup> t (A <sup>2</sup> s)		Watts loss (W)	Catalog numbers	
	Vac	Vdc	Pre-arcing	Clearing @ 500Vac		Standard	RoHS compliant
0.25	500	—	0.01	0.05	2.7	FWH-250A6F	FWH-250A6FR
0.5	500	—	0.05	0.25	1.2	FWH-500A6F	FWH-500A6FR
1	500	600	0.4	2	1.7	FWH-001A6F	FWH-001A6FR
2	1000	600	1.3	3.5	3.2	FWH-002A6F	FWH-002A6FR
3.15	500	600	3.1	7.7	2.9	FWH-3.15A6F	FWH-3.15A6FR
4	500	600	—	—	—	FWH-004A6F	FWH-004A6FR
5	500	600	15	40	2.1	FWH-005A6F	FWH-005A6FR
6.3	500	—	36	90	2.3	FWH-6.30A6F	FWH-6.30A6FR
7	500	—	50	125	2.5	FWH-007A6F	FWH-007A6FR
10	500	—	9.9	139	2.86	FWH5-010A6F	FWH5-010A6FR
12.5	500	—	20	60	3.53	FWH5-12-5A6F	FWH5-12-5A6FR
15	500	—	44	146	3.08	FWH5-015A6F	FWH5-015A6FR
16	500	—	48	177	4.48	FWH5-016A6F	FWH5-016A6FR
20	500	—	75	259	4.26	FWH5-020A6F	FWH5-020A6FR
25	500	—	126	345	—	FWH-025A6F	FWH-025A6FR
30	500	—	145	430	—	FWH-030A6F	FWH-030A6FR

0.25-7A 300% minimum opening current at rated voltage.

10-30A 200% minimum opening current at rated voltage.

Data Sheet: 720038

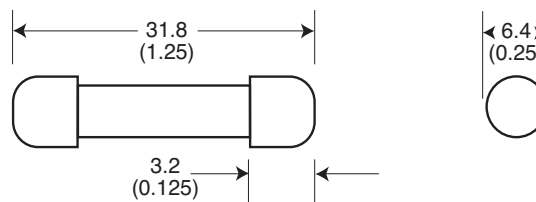
#### Agency information

- CE
- RoHS compliant
- UL Recognized JFHR2, E91958, 0.25-7A
- UL Recognized JFHR2, E19180, 10-30A
- CSA Component Acceptance file Class 1422-30, 1422-90 (53787) 0.25-7A

#### Features:

- Low watts loss in a compact size
- Excellent cycling capability and DC performance
- Low arc voltage and low energy let-through (I<sup>2</sup>t)

#### Dimensions:

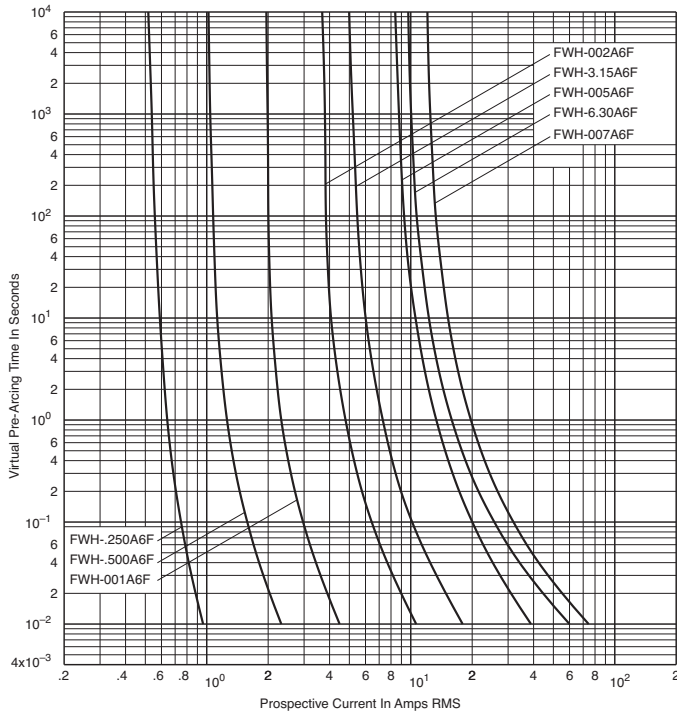


#### Typical applications:

- DC common bus
- DC drives
- Power converters/rectifiers
- Reduced voltage starters

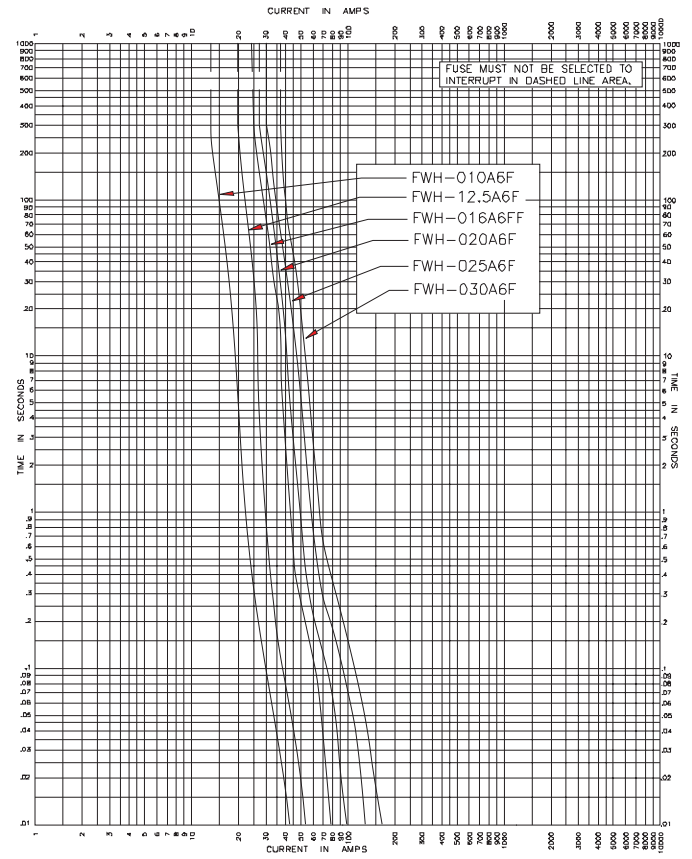
## FWH 0.25-7A: 500V (6 x 32mm)

Time-current curve



## FWH 10-30A: 500V (6 x 32mm)

Time-current curve



# 6

## High speed fuses

Ferrule

### FWH 500V: 1-30A (14 x 51mm)

#### Specifications

**Description:** Ferrule style high speed fuses.

**Dimensions:** See dimensions illustration.

#### Ratings:

- Volts: — 500Vac
- Amps: — 1-30A
- IR: — 200kA RMS Sym.
- 50kA @500Vdc

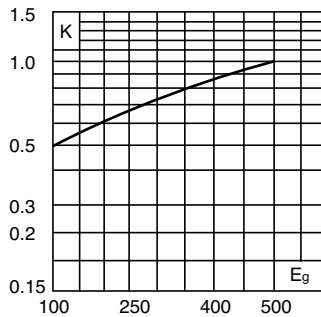
**Agency information:** CE, UL Recognized 1-30A and CSA Component Acceptance file Class 1422-30, (53787) on: 5 - 30A.



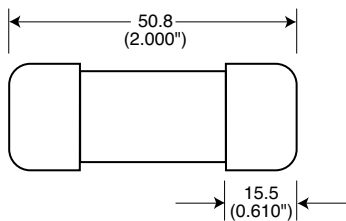
#### Electrical characteristics

##### Total clearing I<sup>2</sup>t

The total clearing I<sup>2</sup>t at rated voltage and at power factor of 15% are given in the electrical characteristics. For other voltages, the clearing I<sup>2</sup>t is found by multiplying by correction factor, K, given as a function of applied working voltage, E<sub>g</sub>, (rms).

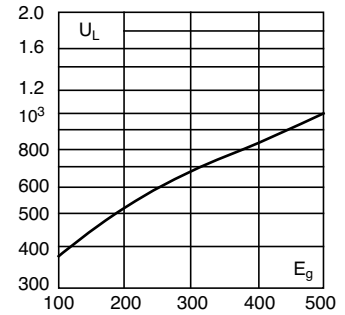


#### Dimensions - mm (inches)



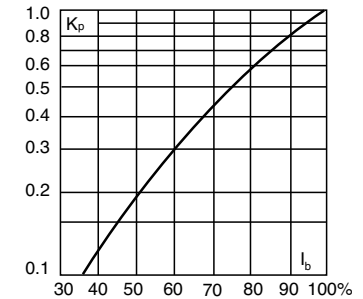
#### Arc voltage

This curve gives the peak arc voltage, U<sub>L</sub>, which may appear across the fuse during its operation as a function of the applied working voltage, E<sub>g</sub>, (rms) at a power factor of 15%.



#### Power losses

Watts loss at rated current is given in the electrical characteristics. The curve allows the calculation of the power losses at load currents lower than the rated current. The correction factor, K<sub>p</sub>, is given as a function of the RMS load current, I<sub>b</sub>, in % of the rated current.



#### Catalog numbers

Catalog numbers	Size	Electrical characteristics			
		Rated current RMS-amps	I <sup>2</sup> t (A <sup>2</sup> sec)		Watts loss
			Pre-arc	Clearing at 500V	
FWH-1A14F	14 x 51mm (½" x 2")	1	—	—	—
FWH-2A14F		2	—	—	—
FWH-3A14F	3	—	—	—	2.3
FWH-4A14F	4	—	—	—	—
FWH-5A14F	5	1.6	6.4	1.5	1.5
FWH-6A14F	6	1.6	6.4	1.5	1.5
FWH-10A14F	10	3.6	13	4	4
FWH-12A14F	12	—	—	—	—
FWH-15A14F	15	10	40	5.5	5.5
FWH-20A14F	20	26	96	6	6
FWH-25A14F	25	49	191	7	7
FWH-30A14F	30	58	232	9	9

- Watts loss provided at rated current.
- See accessories on page 6-123.

#### Features and benefits

- Excellent cycling capability and DC performance
- Low arc voltage and low energy let-through (I<sup>2</sup>t)
- Low watts loss in a compact size
- Used with finger-safe holders/blocks

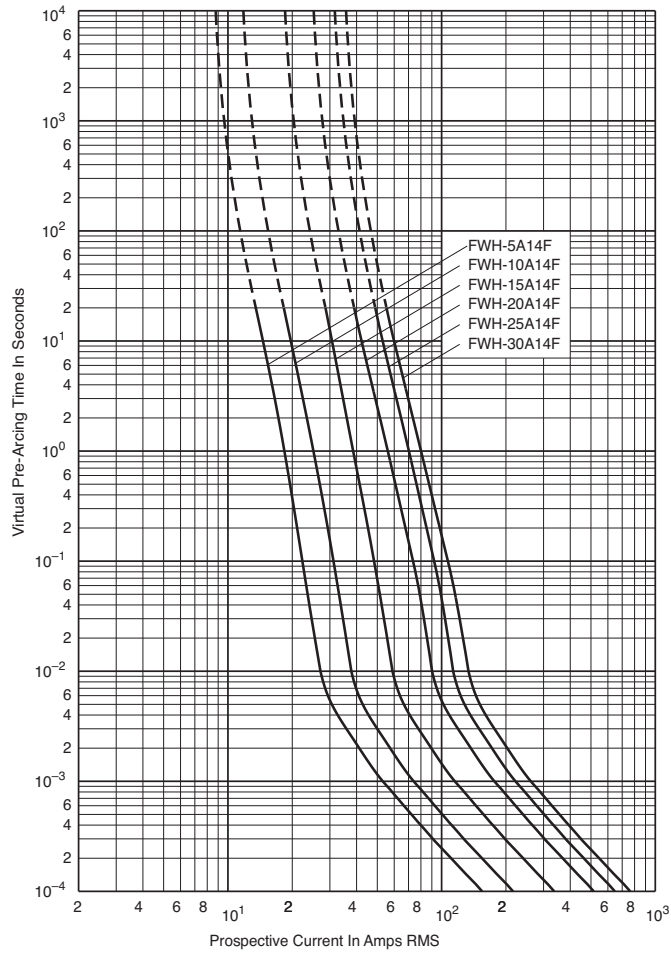
#### Typical applications

- DC common bus
- DC drives
- Power converters/rectifiers
- Reduced voltage starters

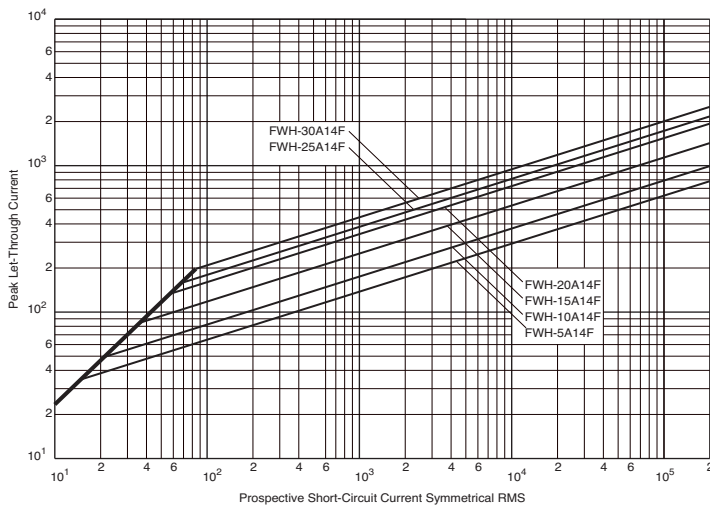


## FWH 1-30A: 500V (14 x 51mm)

Time-current curve



Peak let-through curve



Data Sheet: 35785298

High speed fuses

# 6

## High speed fuses

Ferrule

### FWC 600V: 6-32A (10 x 38mm)

#### Specifications

**Description:** Ferrule style high speed fuses.

**Dimensions:** See dimensions illustration.

#### Ratings:

Volts: — 600Vac/700Vdc (6-25A)

600Vac (30-32A)

Amps: — 6-32A

IR: — 200kA RMS Sym.

— 50kA @ 700Vdc (6-25A)

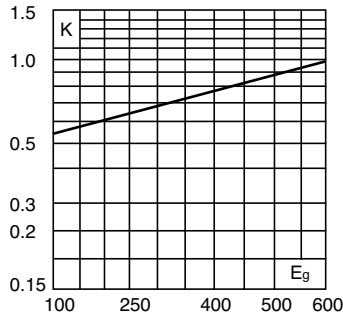
**Agency information:** CE, UL Recognized JFHR8.E91958 6-32A and CSA Component Acceptance file Class 1422-30, (53787) on (6-32A).



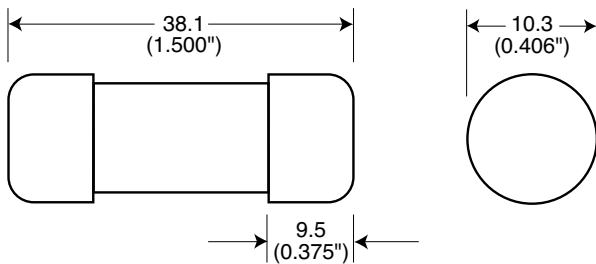
#### Electrical characteristics

##### Total clearing I<sup>2</sup>t

The total clearing I<sup>2</sup>t at rated voltage and at power factor of 15% are given in the electrical characteristics. For other voltages, the clearing I<sup>2</sup>t is found by multiplying by correction factor, K, given as a function of applied working voltage, E<sub>G</sub>, (rms).

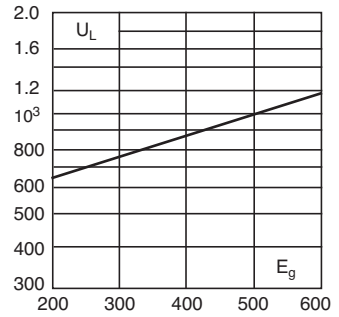


#### Dimensions - mm (in)



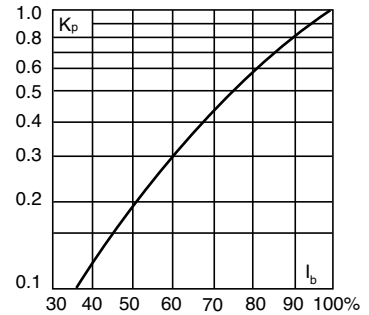
#### Arc voltage

This curve gives the peak arc voltage, U<sub>L</sub>, which may appear across the fuse during its operation as a function of the applied working voltage, E<sub>G</sub>, (rms) at a power factor of 15%.



#### Power losses

Watts loss at rated current is given in the electrical characteristics. The curve allows the calculation of the power losses at load currents lower than the rated current. The correction factor, K<sub>p</sub>, is given as a function of the RMS load current, I<sub>b</sub>, in % of the rated current.



#### Catalog numbers

Catalog numbers	Size	Electrical characteristics			
		Rated current RMS-amps	I <sup>2</sup> t (A <sup>2</sup> sec)		Watts loss
			Pre-arc	Clearing at 600V	
FWC-2A10F		2	0.5	3	1.2
FWC-3A10F		3	1.6	11	1.5
FWC-4A10F		4	5.2	32	1.5
FWC-6A10F		6	4	30	1.5
FWC-8A10F		8	6	50	2.0
FWC-10A10F		10	9	70	2.5
FWC-12A10F	10 x 38mm	12	15	120	3.0
FWC-16A10F	(1 3/32" x 1 1/2")	16	25	150	3.5
FWC-20A10F		20	34	260	4.8
FWC-25A10F		25	60	390	6.0
FWC-30A10F		30	95	600	7.5
FWC-32A10F		32	95	600	7.5

• Watts loss provided at rated current.  
• See accessories on page 6-123.

#### Features and benefits

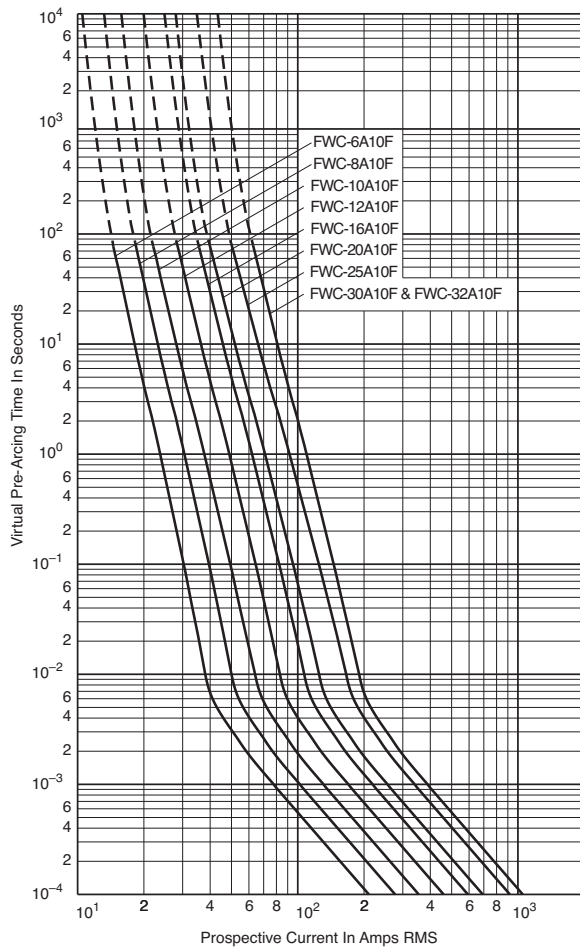
- Excellent cycling capability and DC performance
- Low arc voltage and low energy let-through (I<sup>2</sup>t)
- Low watts loss in a compact size
- Used with finger-safe holders/blocks

#### Typical applications

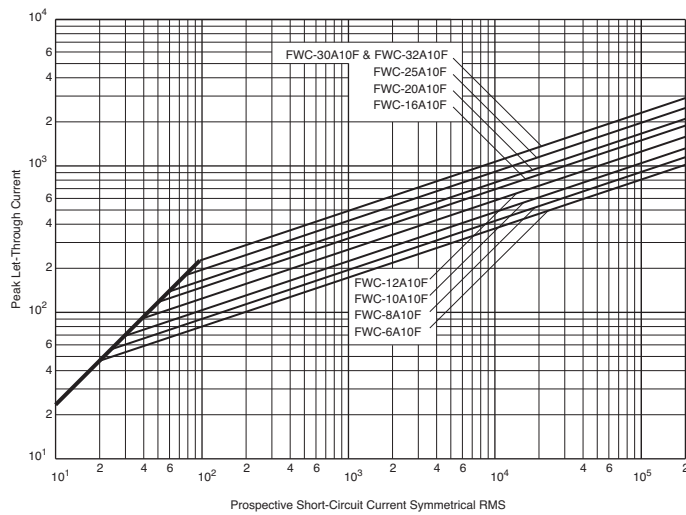
- DC Common bus
- DC Drives
- Power converters/rectifiers
- Reduced voltage starters

## FWC 6-32A: 600V (10 x 38mm)

Time-current curve



Peak let-through curve



Data Sheet: 35785306

High speed fuses

# 6

## High speed fuses

Ferrule

### FWP 690V/700V: 1-50A (14 x 51mm) striker optional

#### Specifications

**Description:** Ferrule style high speed fuses with and without indicating striker.

**Dimensions:** See dimensions illustrations.

#### Ratings:

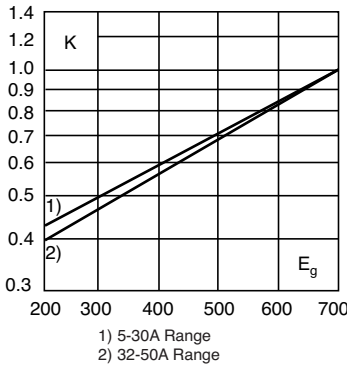
- Volts: — 690Vac (IEC)
- 700Vac (UL)
- 800Vdc (5-50A)
- Amps: — 1-50A
- IR: — 200kA RMS Sym.
- 50kA @800Vdc

**Agency information:** CE, UL Recognized JFHR2.E91958, CSA Component Acceptance file Class 1422-30, 1422-90 (53787) for versions without indicator only. Designed and tested to IEC 60269: Part 4.

#### Electrical characteristics

##### Total clearing I<sup>2</sup>t

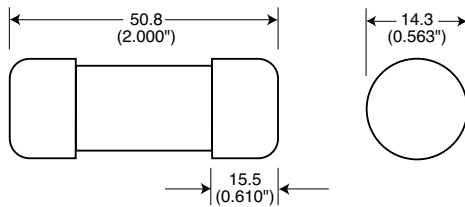
The total clearing I<sup>2</sup>t at rated voltage and at power factor of 15% are given in the electrical characteristics. For other voltages, the clearing I<sup>2</sup>t is found by multiplying by correction factor, K, given as a function of applied working voltage, E<sub>g</sub>, (rms).



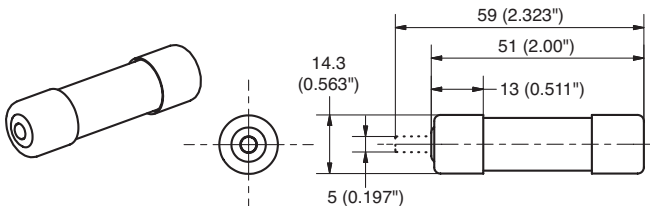
1) 5-30A Range  
2) 32-50A Range

#### Dimensions - mm (in)

##### Without striker



##### With Striker



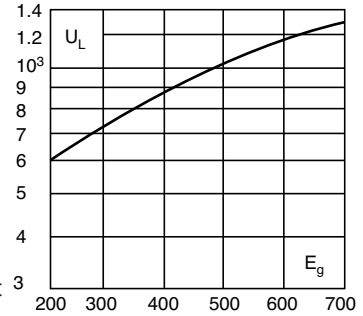
Data Sheet: 720025



FWP with striker option.

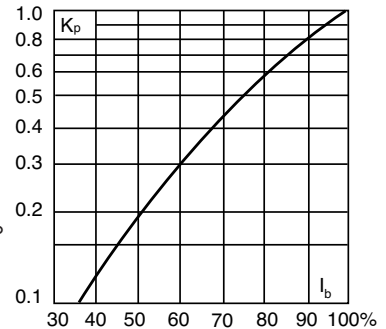
#### Arc voltage

This curve gives the peak arc voltage, U<sub>L</sub>, which may appear across the fuse during its operation as a function of the applied working voltage, E<sub>g</sub>, (rms) at a power factor of 15%.



#### Power losses

Watts loss at rated current is given in the electrical characteristics. The curve allows the calculation of the power losses at load currents lower than the rated current. The correction factor, K<sub>p</sub>, is given as a function of the RMS load current, I<sub>b</sub>, in % of the rated current.



#### Catalog numbers

Catalog numbers	Size	Electrical characteristics			
		Current RMS-amps	Rated Minimum melting	I <sup>2</sup> t (A <sup>2</sup> sec) Clearing at rated voltage	Watts loss
Without striker					
FWP-1A14F	14 x 51mm (% <sup>1</sup> x 2 <sup>1</sup> )	1	—	—	—
FWP-2A14F		2	—	—	—
FWP-2.5A14F		2.5	—	—	—
FWP-3A14F		3	—	—	—
FWP-4A14F		4	—	—	—
FWP-5A14F		5	1.6	11.0	1.5
FWP-10A14F		10	3.6	38.5	4
FWP-15A14F		15	8.6	70	5.5
FWP-20A14F		20	26.0	230	6
FWP-25A14F		25	46.5	375	7
FWP-30A14F	30	58	485	9	
FWP-32A14F	32	68	600	7.6	
FWP-40A14F	40	84	750	8	
FWP-50A14F	50	200	1800	9	
With striker*					
FWP-10A14FI	14 x 51mm (% <sup>1</sup> x 2 <sup>1</sup> )	10	3.6	38.5	4
FWP-15A14FI		15	8.6	70	5.5
FWP-20A14FI		20	26.0	230	6
FWP-25A14FI		25	46.5	375	7
FWP-30A14FI		30	58	485	9
FWP-32A14FI		32	68	600	7.6
FWP-40A14FI		40	84	750	8
FWP-50A14FI		50	200	1800	9

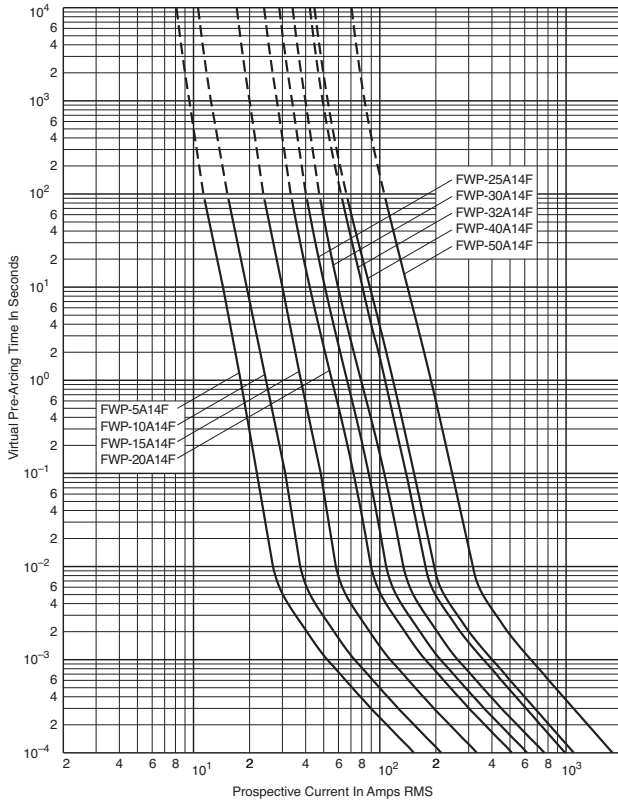
\*Striker range is 600Vdc only  
• Watts loss provided at rated current.  
• See accessories on page 6-123.

#### Features and benefits

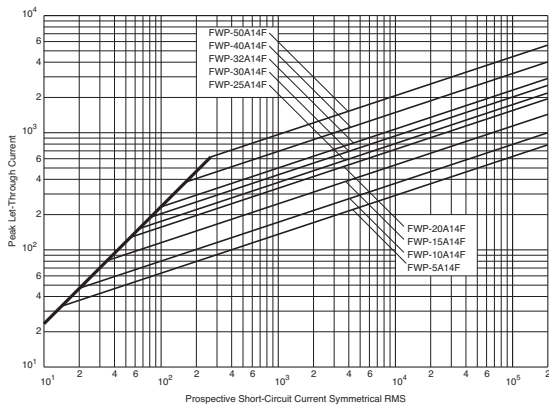
- Excellent cycling capability and DC performance
- Low arc voltage and low energy let-through (I<sup>2</sup>t)
- Low watts loss in a compact size
- Used with finger-safe holders/blocks

## Without striker FWP 5-50A: 660V/700V (14 x 51mm)

### Time-current curve



### Peak let-through curve



High speed fuses

# 6

## High speed fuses

Ferrule - IEC/UL

### FWP 690V/700V: 20-100A (22 x 58mm) striker optional

#### Specifications

**Description:** Ferrule style high speed fuses with and without indicating striker.

**Dimensions:** See dimensions illustration.

#### Ratings:

- Volts: — 690Vac (IEC)
  - 700Vac (UL)
  - 500Vdc (20-100A)
- Amps: — 20-100A
  - IR: — 200kA RMS Sym.
  - 50kA @ 500Vdc

**Agency information:** CE, UL Recognized JFHR2.E91958, CSA Component Acceptance file Class 1422-30, 1422-90 (53787).

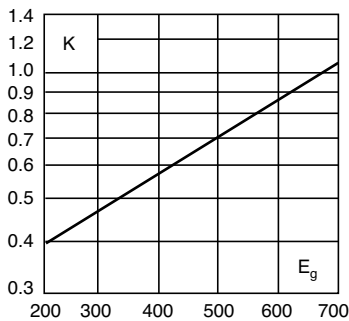


FWP with striker option.

#### Electrical characteristics

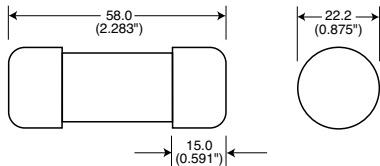
##### Total clearing I<sup>2</sup>t

The total clearing I<sup>2</sup>t at rated voltage and at power factor of 15% are given in the electrical characteristics. For other voltages, the clearing I<sup>2</sup>t is found by multiplying by correction factor, K, given as a function of applied working voltage, E<sub>g</sub>, (rms).

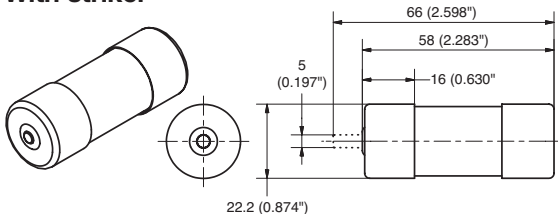


#### Dimensions - mm (in)

##### Without striker



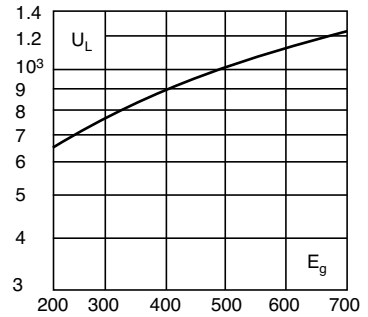
##### With striker



Data Sheet: 720026

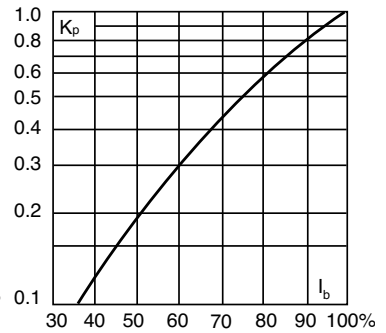
#### Arc voltage

This curve gives the peak arc voltage, U<sub>L</sub>, which may appear across the fuse during its operation as a function of the applied working voltage, E<sub>g</sub>, (rms) at a power factor of 15%.



#### Power losses

Watts loss at rated current is given in the electrical characteristics. The curve allows the calculation of the power losses at load currents lower than the rated current. The correction factor, K<sub>p</sub>, is given as a function of the RMS load current, I<sub>b</sub>, in % of the rated current.



#### Catalog numbers

Catalog numbers	Size	Electrical characteristics			
		Rated current RMS-amps	I <sup>2</sup> t (A <sup>2</sup> sec)		Watts loss
			Minimum melting	Clearing at rated voltage	
Without striker	22 x 58mm (7/8" x 2 1/2")	20	19.0	260	5
FWP-20A22F		25	34.0	410	6
FWP-25A22F		32	53.5	605	8
FWP-32A22F		40	68	750	9
FWP-40A22F		50	135	1600	9.5
FWP-50A22F		63	280	3080	11
FWP-63A22F		80	600	6600	13.5
FWP-80A22F		100*	1100	12500	16
FWP-100A22F					
With striker		22 x 58mm (7/8" x 2 1/2")	20	19.0	260
FWP-20A22FI	25		34.0	410	6
FWP-25A22FI	32		53.5	605	8
FWP-32A22FI	40		68	750	9
FWP-40A22FI	50		135	1600	9.5
FWP-50A22FI	63		280	3080	11
FWP-63A22FI	80		600	6600	13.5
FWP-80A22FI	100*		1100	12500	16
FWP-100A22FI					

\*IEC/UL Voltage rating 690/700

#### Features and benefits

- Excellent cycling capability and DC performance
- Low arc voltage and low energy let-through (I<sup>2</sup>t)
- Low watts loss in a compact size
- Used with finger-safe holders/blocks

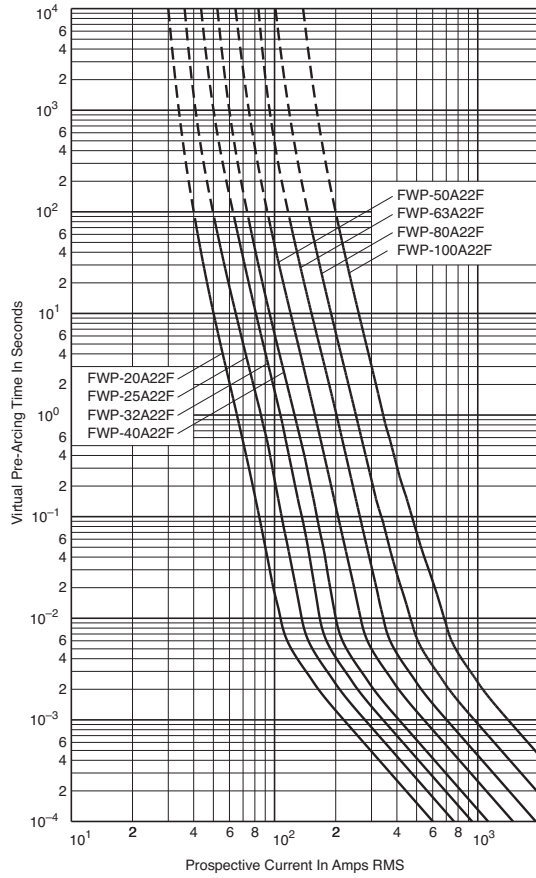
#### Typical applications

- DC common bus
- DC drives
- Power converters/rectifiers
- Reduced voltage starters

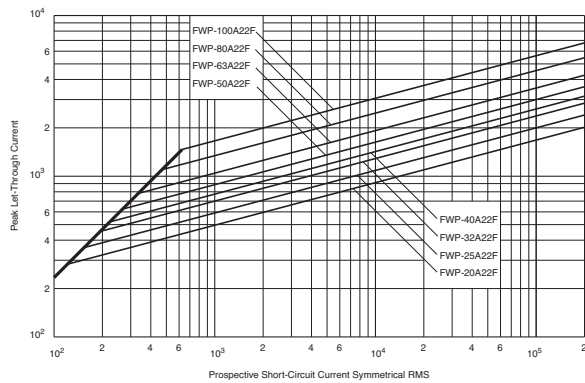
## Without striker

### FWP 20-100A: 660V/700V (22 x 58mm)

#### Time-current curve



#### Peak let-through curve



High speed fuses

# 6

## High speed fuses

### Ferrule

#### FWK 750V: 5-30A (20 x 127mm) 35-60A (25 x 146mm)

##### Specifications

**Description:** Ferrule style high speed fuses.

**Dimensions:** See dimensions illustrations.

##### Ratings:

- Volts: — 750Vac
- 750Vdc (time constant = 10-15mS)

Amps: — 5-60A

IR: — 45kA RMS Sym.

**Agency information:** CE

##### Catalog numbers



Catalog numbers	Size	Electrical characteristics		
		Rated current RMS-amps	I <sup>2</sup> t (A <sup>2</sup> sec)	
			Pre-arc	Clearing at 750Vdc
FWK-5A20F	20 x 127mm ( <sup>3</sup> / <sub>16</sub> " x 5")	5	8.5	16
FWK-8A20F		8	50	100
FWK-10A20F		10	95	200
FWK-15A20F		15	100	240
FWK-20A20F		20	125	315
FWK-25A20F		25	400	1100
FWK-30A20F	30	800	2600	
FWK-35A25F	25 x 146mm (1" x 5 <sup>7</sup> / <sub>16</sub> ")	35	1300	4300
FWK-40A25F		40	1600	5300
FWK-50A25F		50	3100	12000
FWK-60A25F		60	5900	24000

Recommended fuseholders for 20x127, -2, -3  
Recommended fuseclips for 20x127, 1A1837  
Recommended fuseclips for 25x146, A3354705

##### Features and benefits

- Excellent cycling capability and DC performance
- Low arc voltage and low energy let-through (I<sup>2</sup>t)
- Low watts loss in a compact size
- Used with finger-safe holders/blocks

##### Typical applications

- DC common bus
- DC drives
- Power converters/rectifiers
- Reduced voltage starters

##### Dimensions - mm (in)

Fig. 1: 5-30A

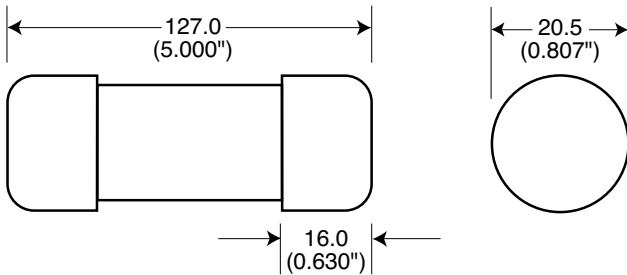
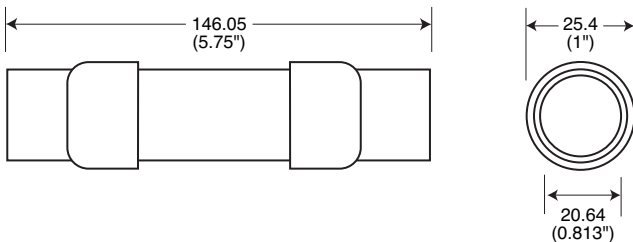


Fig. 2: 35-60A

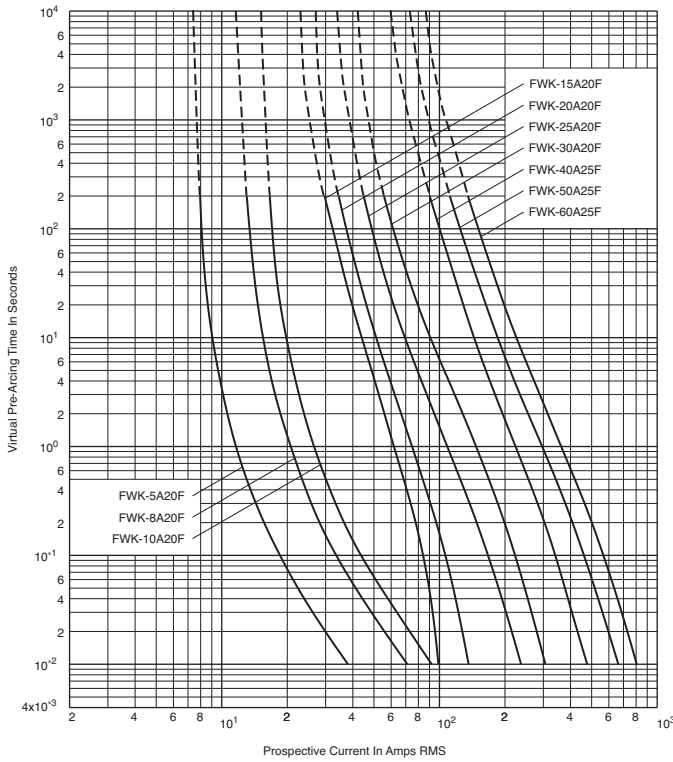


Data Sheet: 720039



**FWK 750V: 5-30A (20 x 127mm)  
35-60A (25 x 146mm)**

**Time-current curve**



High speed fuses

# 6

## High speed fuses

Ferrule

### FWJ 1000V: 20-30A (14 x 67mm)

#### Specifications

**Description:** Ferrule style high speed fuses.

**Dimensions:** See dimensions illustration.

#### Ratings:

Volts: — 1000Vac/800Vdc

Amps: — 20-30A

IR: — 25kA RMS Sym.

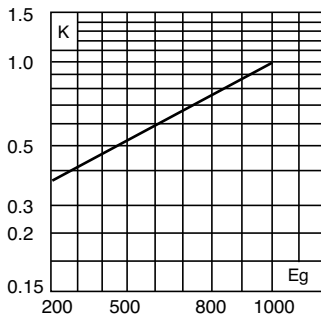
— 20kA @ 800Vdc

**Agency information:** CE, UL Recognized JFHR2.E91958

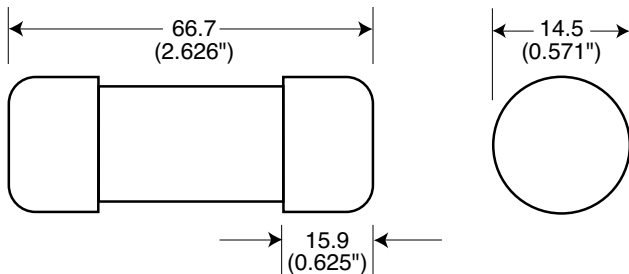
#### Electrical characteristics

#### Total clearing I<sup>2</sup>t

The total clearing I<sup>2</sup>t at rated voltage and at power factor of 15% are given in the electrical characteristics. For other voltages, the clearing I<sup>2</sup>t is found by multiplying by correction factor, K, given as a function of applied working voltage, E<sub>g</sub>, (rms).



#### Dimensions - mm (in)



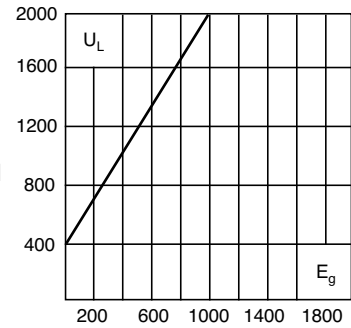
#### Fuseclips:

- Catalog number: 5591 (see data sheet 2132)



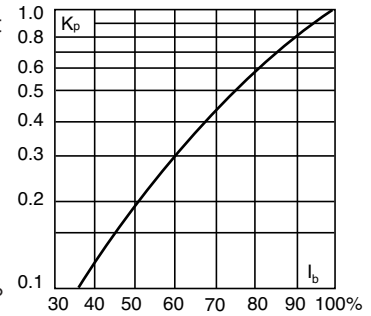
#### Arc voltage

This curve gives the peak arc voltage, U<sub>L</sub>, which may appear across the fuse during its operation as a function of the applied working voltage, E<sub>g</sub>, (rms) at a power factor of 15%.



#### Power losses

Watts loss at rated current is given in the electrical characteristics. The curve allows the calculation of the power losses at load currents lower than the rated current. The correction factor, K<sub>p</sub>, is given as a function of the RMS load current, I<sub>D</sub>, in % of the rated current.



#### Catalog numbers

Catalog numbers	Size	Electrical characteristics			
		Rated current RMS-amps	I <sup>2</sup> t (A <sup>2</sup> sec)		Watts loss
			Pre-arc	Clearing at 1000V	
FWJ-20A14F	14 x 67mm	20	25	220	9
FWJ-25A14F	(% x 2%)	25	33	350	11
FWJ-30A14F		30	52	450	14

- Watts loss provided at rated current.
- See accessories on page 6-123.

#### Features and benefits

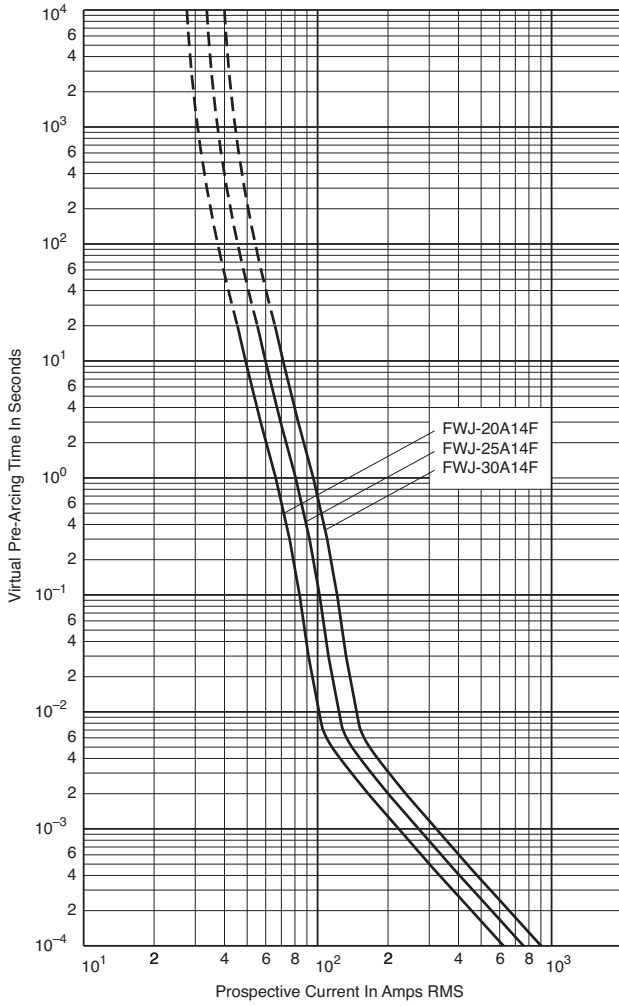
- Excellent cycling capability and DC performance
- Low arc voltage and low energy let-through (I<sup>2</sup>t)
- Low watts loss in a compact size
- Used with finger-safe holders/blocks

#### Typical applications

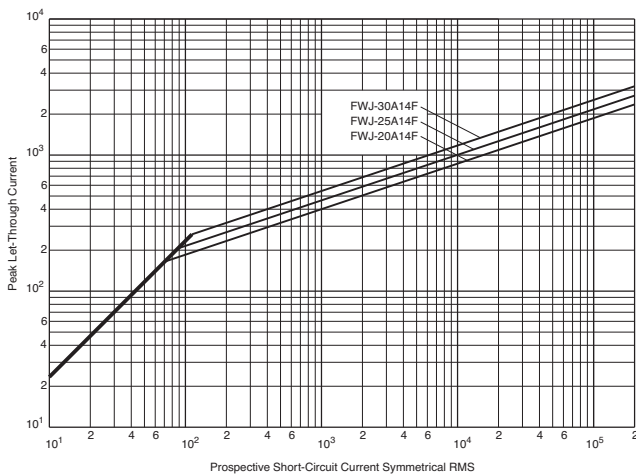
- DC common bus
- DC drives
- Power converters/rectifiers
- Reduced voltage starters

FWJ 20-30A: 1000V (14 x 67mm)

Time-current curve



Peak let-through curve



Data Sheet: 35785315

High speed fuses

# 6

## High speed fuses

Ferrule

### FWS/FWL 1000Vdc: 2-30A (20 x 127mm)

#### Specifications

**Description:** Ferrule style full range fuses.

**Dimensions:** See dimensions illustrations.

#### Ratings:

- Volts: — 1200Vac (FWL 20-30A)
- 1400Vac (FWS 8-15A)
- 2100Vac (FWS 2-6A)
- 1000Vdc (FWL/FWS 2-30)

Amps: — 2-30A

- IR: — 45kA RMS Sym.
- 30kA @ 1000Vdc

**Agency information:** CE, IEC 60077

#### Catalog numbers



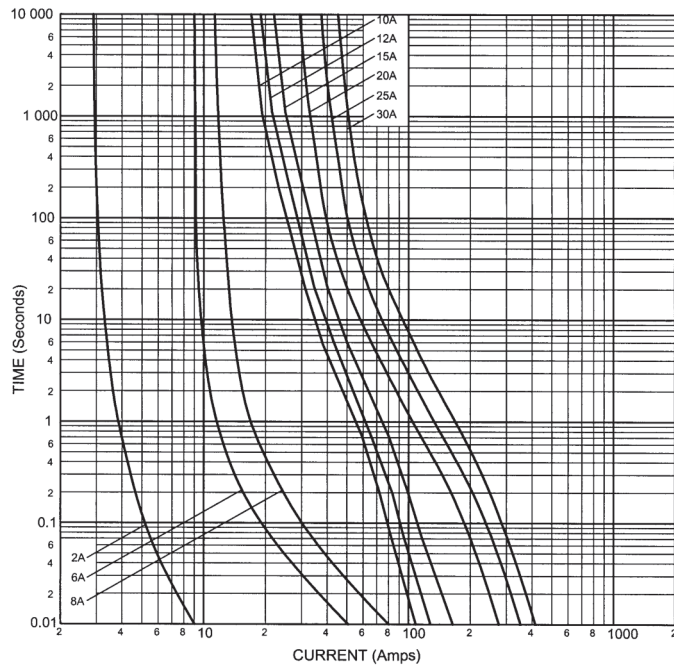
#### Features and benefits

- Excellent cycling capability and DC performance
- Low arc voltage and low energy let-through ( $I^2t$ )
- Low watts loss in a compact size
- Used with finger-safe holders/blocks

#### Typical applications

- DC Common bus
- DC Drives
- Power converters/rectifiers
- Reduced voltage starters
- Traction aux circuits
- Capacitor protection

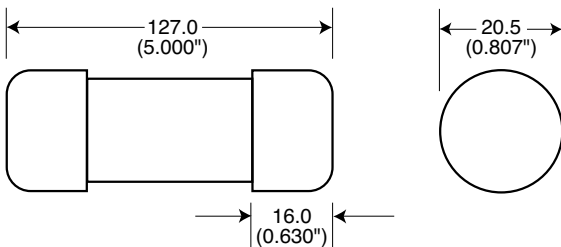
#### Time-current curve



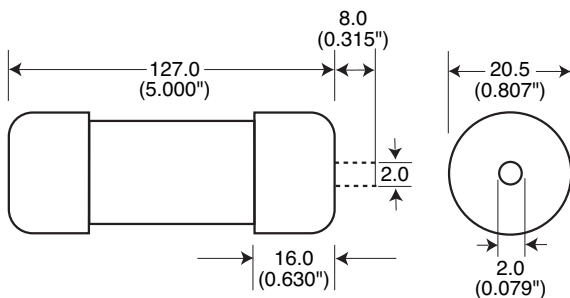
Catalog numbers	Size	Electrical characteristics			
		Rated current RMS-amps	$I^2t$ (A <sup>2</sup> sec)		Watts loss
			Pre-arc	Clearing at 1000Vdc	
FWS-2A20F	20 x 127mm ( $\frac{13}{16}$ " x 5")	2	0.8	2.4	4.4
FWS-6A20F		6	27	81	6.7
FWS-8A20F		8	64	192	7.6
FWS-10A20F		10	118	277	3.0
FWS-12A20F		12	170	380	3.4
FWS-15A20F	15	209	500	5.0	
FWL-20A20F	20 x 127mm ( $\frac{13}{16}$ " x 5")	20	675	1550	5.9
FWL-25A20F		25	1200	2760	6.5
FWL-30A20F		30	1850	4300	7.5

- ADD "I" to catalog number for indicating version.
- Enclosed finger-safe fuse holder – CH127
- See accessories on page 6-123.
- Watts loss provided at rated current.

#### Dimensions - mm (in)



#### Indicating version - dimensions - mm (in)



Data Sheet: 720040

## Fuse holders

### Specifications

**Catalog Symbol:** CH

**Description:** DIN-Rail mount fuse holders

### Agency information:

UL File E14853, Guide IZLT Listed, IZLT2 Recognized  
 CSA: File 47235, CHPV and CHM - Class 6225-30,  
 CHCC - Class 6225-01

**Ratings:** 600V/30A (UL)  
 690V/32A (IEC)



### Features and benefits

- Finger-safe design - No exposed contacts
- DIN-Rail mount (35mm) - Fits standard mounting rails
- Optional open fuse indication lights tells fuse status at a glance
- Handle/fusepuller easily installs and removes fuses
- Available in single and multi-pole configurations
- Wire ready lugs and spade terminal connections save installation time
- CE marking
- Available up to 1000Vdc
- PLC device available for remote monitoring

### Typical applications

- Switchboard panel, control consoles, small motors, transformers, and similar applications

### Recommended Bussmann series fuse types

Class CC North American Class CC fuses - LP-CC, FNQ-R, KTK-R

10 x 38 North American midjet fuses - FNQ, KTK, AGU, BAF, BAN, FNM, FWA, FWC, and PV

14 x 51 FWX, FWH, FWP and NON

22 x 58 FWP

See pages 9-2 – 9-7 for CH fuse holder information.

## Fuse blocks

### Specifications

**Catalog symbol:** J70032, J70100

**Description:** Fuse blocks for 22x58mm and 14x51mm fuses.

### Ratings:

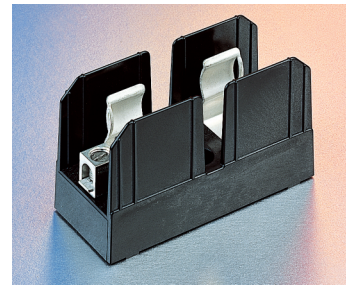
Volts: — 700Vac/dc

Amps: — 32-100A

Withstand: — 200kA RMS Sym.

**Agency information:** CE, UL Recognized, Guide IZLT2, File E14853

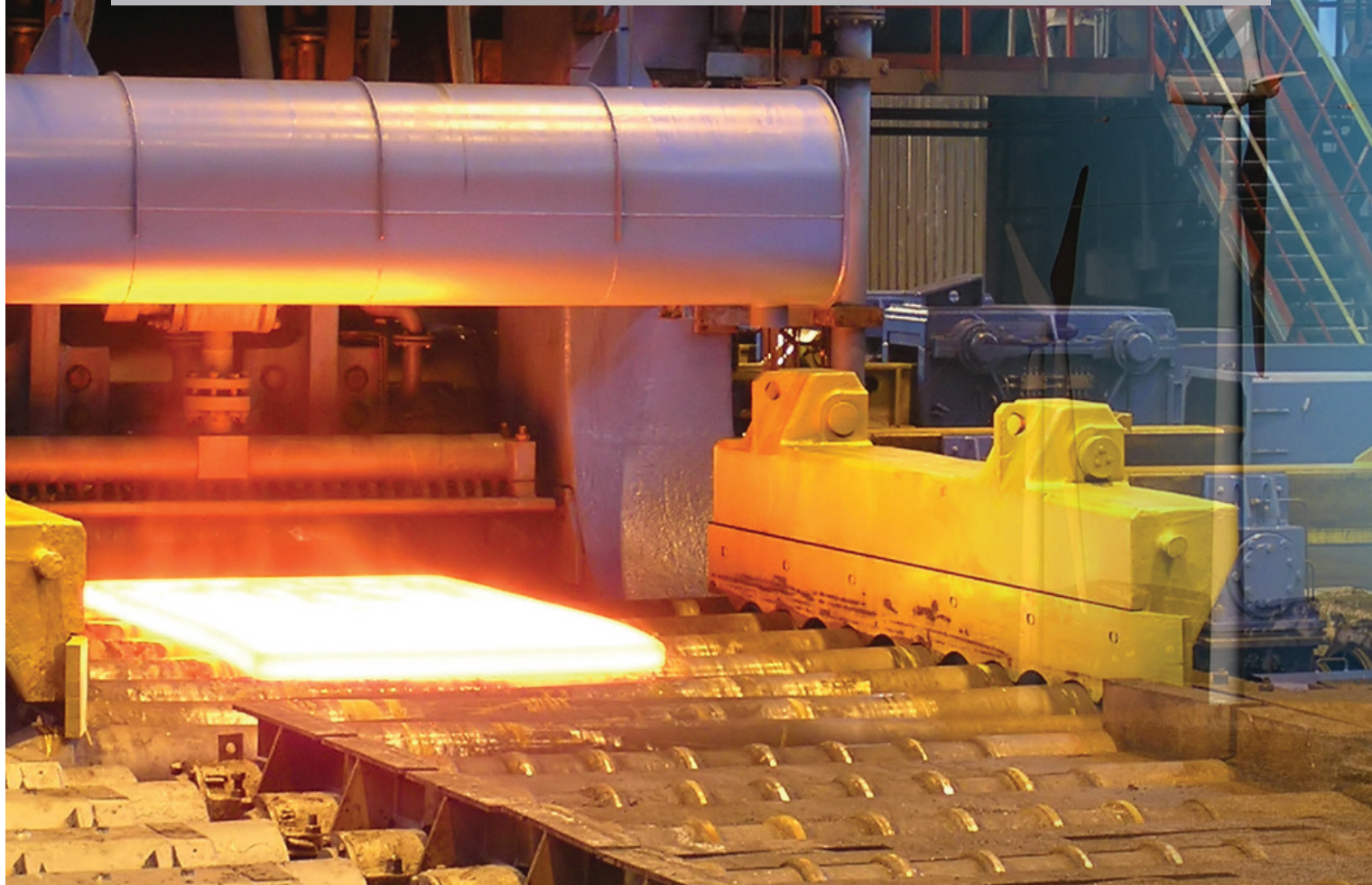
**Flammability rating:** UL 94V0



### Catalog numbers

Catalog numbers	Fuse size	Amps	Poles	Max wire size	Terminations
J70032-1CR	14x51	32	1	#2	Box lug w/ retaining clip
J70032-2CR		32	2	#2	
J70032-3CR		32	3	#2	
JM70100-1CR	22x58	100	1	#2	
JM70100-2CR		100	2	#2	
JM70100-3CR		100	3	#2	

# High speed fuses



Faster lead-time.  
Better protection.  
More energy efficient.

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