AMP-TRAP®–Form 101

# A60X

## SEMICONDUCTOR PROTECTION FUSES


A60X Amp-trap® Form 101 Semiconductor Protection fuses are popular for the protection of higher voltage heavy rectifiers such as traction rectifiers. They can carry long sustained overloads common with heavy duty apparatus. 700A through 2000A sizes are of compact, hockey-puck design, able to provide high power protection in a small space.

### Features/Benefits

- **Low $I^2t$** minimizes damage to protected components on short circuit
- **Controlled arc voltage** reduces stress to circuit components during fuse clearing
- **Choice of mounting types** helps in equipment design

### Ratings

- **AC:** 1-2000A 600V, 100kA I.R.

### Approvals

- UL Recognized Component
- AC: UL Guide No. JFHR2 (35-800A)

### HIGHLIGHTS:

- Fast Acting
- Current Limiting
- Low $I^2t$
- Indicator Options Available

### APPLICATIONS:

- Protection of heavy traction and electro-chemical as well as rectifiers and other heavy-duty equipment

### Catalog Numbering System

| A | 60 | X | 600 | - | 4 | TI |
|---|---|---|---|---|---|---|

**Amp-trap® Fuse** — A

**Rated Volts - 600** — 60

**Style** — X

**Amperes*** — 600

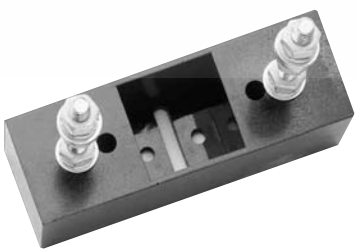
**Mounting Types***
Ferrule — 1
Blades, bolt-in — 4
Hockey puck, bolt-in — 128

**Integral Blown-Fuse Indicator**
Trigger Indicator — TI
Trigger Actuator — TA

* For ampere ratings and types not listed, consult the factory.

### Single Pole Fuse Blocks for A60X Fuses

| FUSE AMPERE RATING | FUSE BLOCK CATALOG NUMBER |
|---|---|
| 1-30 | 70316 |
| 31-60 | P243C |
| 61-100 | P243C |
| 101-200 | P243C |
| 201-400 | P266A |
| 401-600 | P266A |



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### Standard Fuse Ampere Ratings, Catalog Numbers

| AMPERE RATING | CATALOG NUMBER | OUTLINE FIG. | AMPERE RATING | CATALOG NUMBER | OUTLINE FIG. | AMPERE RATING | CATALOG NUMBER | OUTLINE FIG. |
|---|---|---|---|---|---|---|---|---|
| 1 | A60X1-1 | 1 | 80 | A60X80-4TA | 4 | 400 | A60X400-4 | 3 |
| 2 | A60X2-1 | 1 | 90 | A60X90-4 | 3 | 400 | A60X400-4TA | 4 |
| 3 | A60X3-1 | 1 | 100 | A60X100-4 | 3 | 400 | A60X400-4TI | 3 |
| 4 | A60X4-1 | 1 | 100 | A60X100-4TA | 4 | 450 | A60X450-4 | 3 |
| 5 | A60X5-1 | 1 | 100 | A60X100-4TI | 3 | 450 | A60X450-4TA | 4 |
| 6 | A60X6-1 | 1 | 125 | A60X125-4 | 3 | 500 | A60X500-4 | 3 |
| 7 | A60X7-1 | 1 | 125 | A60X125-4TA | 4 | 500 | A60X500-4TA | 4 |
| 8 | A60X8-1 | 1 | 150 | A60X150-4 | 3 | 500 | A60X500-4TI | 3 |
| 10 | A60X10-1 | 1 | 150 | A60X150-4TA | 4 | 600 | A60X600-4 | 3 |
| 12 | A60X12-1 | 1 | 175 | A60X175-4 | 3 | 600 | A60X600-4TA | 4 |
| 15 | A60X15-1 | 1 | 200 | A60X200-4 | 3 | 600 | A60X600-4TI | 3 |
| 20 | A60X20-1 | 1 | 200 | A60X200-4TA | 4 | 700 | A60X700-4 | 5 |
| 25 | A60X25-1 | 1 | 200 | A60X200-4TI | 3 | 700 | A60X700-128 | 7 |
| 30 | A60X30-1 | 1 | 225 | A60X225-4 | 3 | 800 | A60X800-4 | 5 |
| 35 | A60X35-4 | 2 | 250 | A60X250-4 | 3 | 800 | A60X800-4TA | 6 |
| 40 | A60X40-4 | 2 | 250 | A60X250-4TA | 4 | 800 | A60X800-128 | 7 |
| 45 | A60X45-4 | 2 | 250 | A60X250-4TI | 3 | 1000 | A60X1000-128 | 8 |
| 50 | A60X50-4 | 2 | 300 | A60X300-4 | 3 | 1200 | A60X1200-128 | 8 |
| 55 | A60X55-4 | 2 | 300 | A60X300-4TA | 4 | 1500 | A60X1500-128 | 8 |
| 60 | A60X60-4 | 2 | 300 | A60X300-4TI | 3 | 1600 | A60X1600-128 | 8 |
| 70 | A60X70-4 | 3 | 350 | A60X350-4 | 3 | 1800 | A60X1800-128 | 8 |
| 80 | A60X80-4 | 3 | 350 | A60X350-4TA | 4 | 2000 | A60X2000-128 | 8 |

For ampere ratings and styles not listed, call Technical Services.

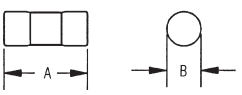

Figure 1

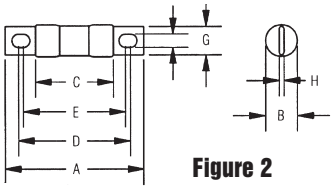

Figure 2

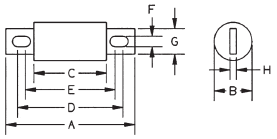

Figure 3

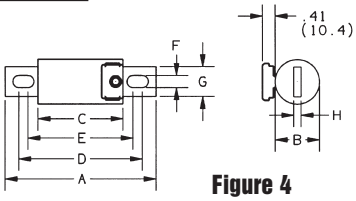

Figure 4

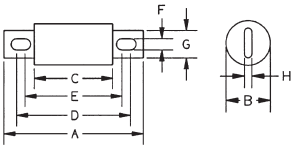

Figure 5

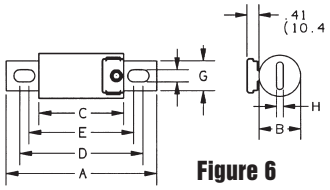

Figure 6

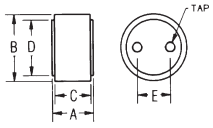

Figure 7

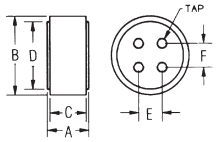

Figure 8

### Dimensions

| OUTLINE REF. | MOUNTING TYPE | FIG. | DIMENSIONS - INCHES (mm) | | | | | | | | TAP |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | A | B | C | D | E | F | G | H | |
| A60X1 to 30 | 1 | 1 | 5.00<br>(127) | .81<br>(20.6) | -<br>- | -<br>- | -<br>- | -<br>- | -<br>- | -<br>- | -<br>- |
| A60X35 to 60 | 4 | 2 | 4.38<br>(111) | .81<br>(20.6) | 2.78<br>(70.6) | 3.69<br>(93.7) | 3.44<br>(87.4) | .34<br>(8.6) | .72<br>(18.3) | .13<br>(3.3) | - |
| A60X70 to 100 | 4, 4TI*, 4TA | 3, 4* | 4.41<br>(112) | 1.00<br>(25.4) | 2.91<br>(73.9) | 3.72<br>(94.5) | 3.59<br>(91.2) | .31<br>(7.9) | .75<br>(19.1) | .13<br>(3.3) | - |
| A60X125 to 200 | 4, 4TI*, 4TA | 3, 4* | 4.41<br>(112) | 1.22<br>(31.0) | 2.91<br>(73.9) | 3.72<br>(94.5) | 3.59<br>(91.2) | .31<br>(7.9) | 1.00<br>(25.4) | .19<br>(4.8) | - |
| A60X225 to 400 | 4, 4TI*, 4TA | 3, 4* | 5.13<br>(130) | 1.50<br>(38.1) | 2.88<br>(73.2) | 4.19<br>(106) | 3.56<br>(90.4) | .41<br>(10.4) | 1.00<br>(25.4) | .25<br>(6.4) | - |
| A60X450 to 600 | 4, 4TI*, 4TA | 3, 4* | 5.13<br>(130) | 2.00<br>(50.8) | 2.88<br>(73.2) | 4.06<br>(103) | 3.69<br>(93.7) | .41<br>(10.4) | 1.50<br>(38.1) | .25<br>(6.4) | - |
| A60X700 to 800 | 4, 4TA* | 5, 6* | 7.25<br>(184) | 2.50<br>(63.5) | 3.00<br>(76.2) | 5.94<br>(151) | 4.56<br>(116) | .53<br>(13.5) | 2.00<br>(50.8) | .38<br>(9.7) | - |
| A60X700 to 800 | 128 | 7 | 4.00<br>(102) | 3.00<br>(76.2) | 3.75<br>(95.3) | 2.50<br>(63.5) | 1.50<br>(38.1) | - | - | - | 3/8-24-1/2 Deep |
| A60X1000 to 1200 | 128 | 8 | 4.00<br>(102) | 3.50<br>(88.9) | 3.75<br>(95.3) | 3.00<br>(76.2) | 1.50<br>(38.1) | 1.50<br>(38.1) | - | - | 3/8-24-1/2 Deep |
| A60X1500 to 2000 | 128 | 8 | 4.00<br>(102) | 4.50<br>(114) | 3.75<br>(95.3) | 3.75<br>(95.3) | 1.50<br>(38.1) | 1.50<br>(38.1) | - | - | 1/2-20-1/2 Deep |

* Optional Trigger Actuator (TA)

# A60X

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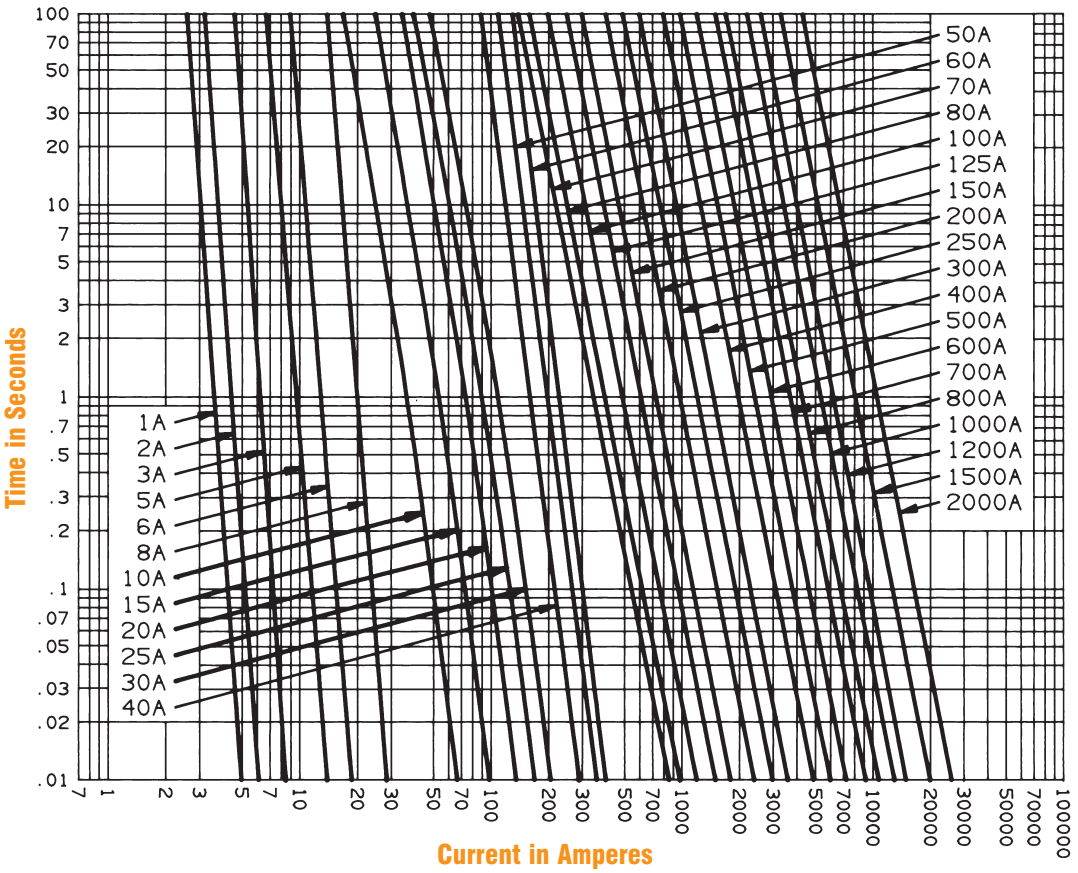
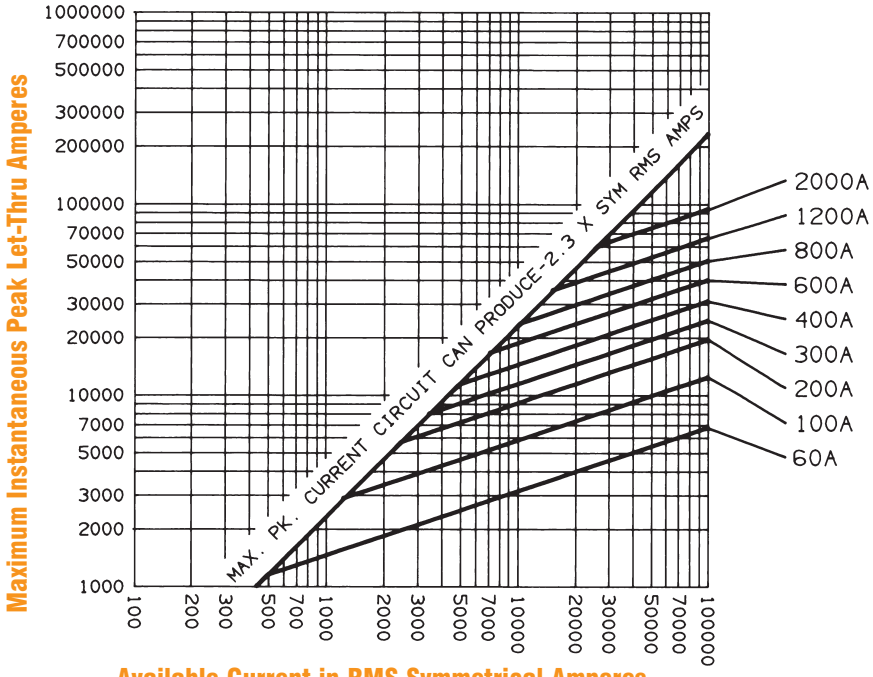
### A60X1 to 2000

**Melting Time – Current Data, 600V Fuses**




**Peak Let-Thru Current Data – A60X60 to 2000, 600 Volts AC**



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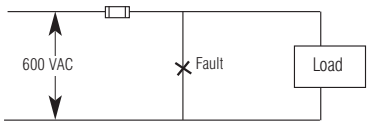



Fig. A

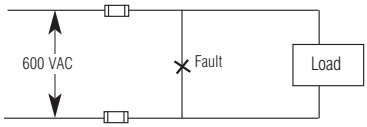



Fig. B

## $I^2t$ Data – 600 Volts AC, 100kA

| FUSE AMPERE RATING | $I^2t$ DATA | | |
|---|---|---|---|
| | MELTING | CLEARING AT 600V | |
| | | 1 FUSE (FIG. A) | 2 FUSES IN SERIES (FIG. B) |
| | ($A^2s$) | ($A^2s$) | ($A^2s$) |
| 1 | .06 | .11 | .09 |
| 2 | .22 | .45 | .36 |
| 3 | .50 | 1.0 | .80 |
| 4 | .90 | 1.8 | 1.4 |
| 5 | 1.4 | 2.8 | 2.2 |
| 6 | 2.0 | 4.0 | 3.2 |
| 7 | 2.7 | 5.4 | 4.3 |
| 8 | 3.6 | 7.1 | 5.7 |
| 10 | 16 | 40 | 30 |
| 12 | 22 | 64 | 48 |
| 15 | 35 | 100 | 70 |
| 20 | 60 | 170 | 130 |
| 25 | 95 | 275 | 210 |
| 30 | 140 | 400 | 290 |
| 35 | 270 | 1,800 | 1,200 |
| 40 | 350 | 2,400 | 1,600 |
| 45 | 450 | 3,000 | 2,000 |
| 50 | 550 | 3,600 | 2,400 |
| 60 | 800 | 5,400 | 3,600 |
| 70 | 4,000 | 13,000 | 9,800 |
| 80 | 5,300 | 17,000 | 13,000 |
| 90 | 6,700 | 22,000 | 16,000 |
| 100 | 8,300 | 27,000 | 20,000 |
| 125 | 13,000 | 42,000 | 31,000 |
| 150 | 19,000 | 60,000 | 45,000 |
| 175 | 25,000 | 80,000 | 61,000 |
| 200 | 33,000 | 110,000 | 80,000 |
| 225 | 42,000 | 140,000 | 100,000 |
| 250 | 52,000 | 170,000 | 125,000 |
| 300 | 75,000 | 240,000 | 180,000 |
| 350 | 100,000 | 340,000 | 240,000 |
| 400 | 130,000 | 490,000 | 320,000 |
| 450 | 170,000 | 620,000 | 400,000 |
| 500 | 210,000 | 770,000 | 500,000 |
| 600 | 300,000 | 1,100,000 | 720,000 |
| 700 | 430,000 | 1,700,000 | 1,000,000 |
| 800 | 560,000 | 2,250,000 | 1,400,000 |
| 1,000 | 875,000 | 3,500,000 | 2,200,000 |
| 1,200 | 1,250,000 | 5,000,000 | 3,100,000 |
| 1,500 | 2,000,000 | 7,900,000 | 4,900,000 |
| 1,600 | 2,200,000 | 9,000,000 | 5,600,000 |
| 1,800 | 2,800,000 | 11,000,000 | 7,100,000 |
| 2,000 | 3,500,000 | 14,000,000 | 8,900,000 |

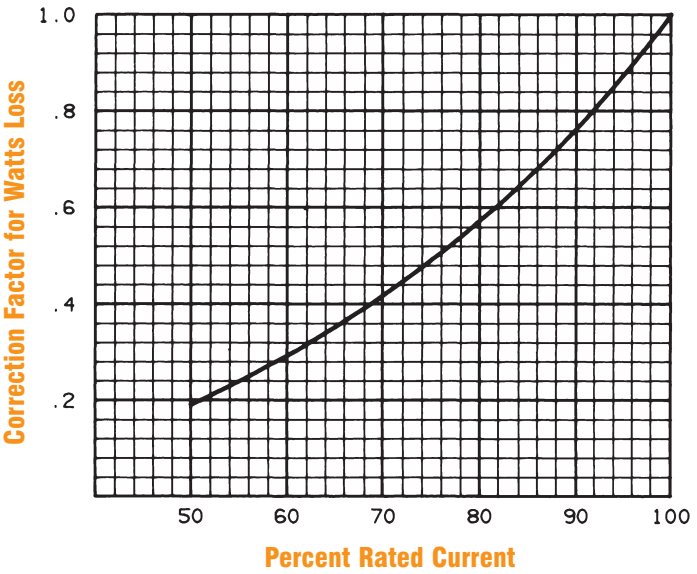
## Watts Loss at Rated Current

| AMPERE RATING | WATTS LOSS (w) | AMPERE RATING | WATTS LOSS (w) | AMPERE RATING | WATTS LOSS (w) |
|---|---|---|---|---|---|
| 10 | 3.8 | 100 | 11 | 700* | 57 |
| 15 | 4.5 | 125 | 12 | 700** | 52 |
| 20 | 4.0 | 150 | 14 | 800* | 67 |
| 25 | 7.3 | 175 | 16 | 800** | 59 |
| 30 | 8.7 | 200 | 19 | 1000 | 72 |
| 35 | 5.2 | 225 | 21 | 1200 | 86 |
| 40 | 6.3 | 300 | 29 | 1500 | 107 |
| 50 | 7.4 | 350 | 35 | 1600 | 117 |
| 60 | 9.1 | 400 | 37 | 1800 | 133 |
| 70 | 7.6 | 450 | 42 | 2000 | 148 |
| 80 | 8.9 | 500 | 47 | 2500 | 183 |
| 90 | 9.7 | 600 | 56 | | |

*Type 4 **Type 128

D

### Watts Loss vs. % Rated Current (Types 1 & 4)




### Watts Loss vs. % Rated Current (Type 128)