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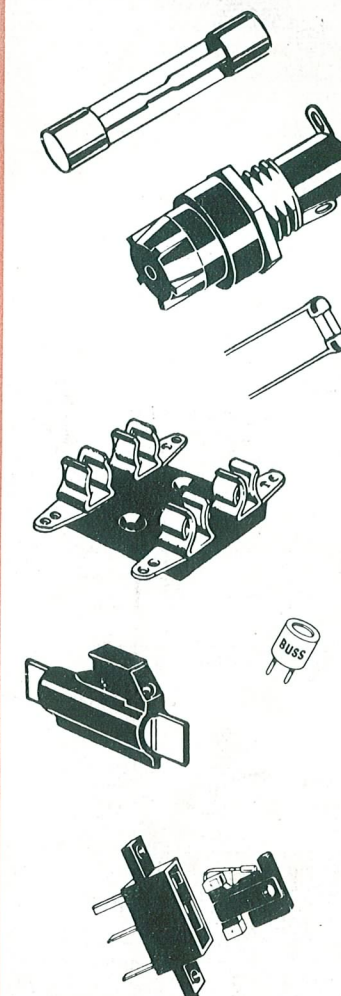
BUSSMANN MFG. DIVISION

McGraw-Edison Company

University at Jefferson St. Louis, Mo. 63107

Phone: Area Code 314 421-1740

For the Protection of Electronic
and Electrical Circuits and Devices



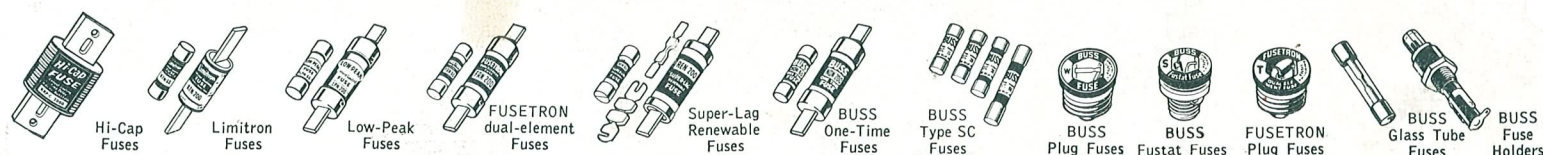
BUSS QUALITY SMALL DIMENSION FUSES and FUSEHOLDERS

BUSS Form SFB
Printed in U. S. A.

589

BUSS QUALITY FUSES

F-2

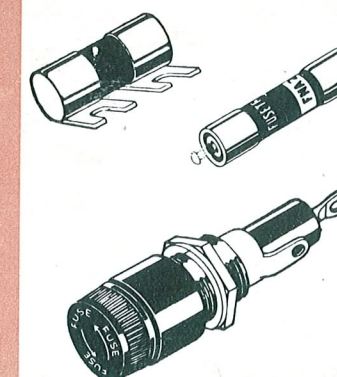


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Form
SFB

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HDH 12		1AG 6	4207 21	4514 20	9967 12			
		3AB 3	4208 21	4515 20				
		3AG 3	4212 21	4520 20				

DIMENSIONS

All dimensions shown are average. When dimensional tolerances are required for specification purposes, write for blueprint.

WEIGHTS

Weights shown are approximate. They include weight of fuses in carton but do not include weight of shipping box.

BLOWING TIME CHARTS

Charts showing time-current characteristics of BUSS and FUSETRON small dimension fuses will be found on pages 21, 22 and 23.

RESISTANCE OF FUSES

The approximate resistance of fast acting fuses, the type generally used for instrument protection, is given to assist in circuit design.

These resistance values can be used as a guide but the actual resistance of any individual fuse may vary due to commercial tolerances and the degree of loading of the fuse.

The resistance of other fuses is not shown because it generally has little significance in the circuit. Should, however, the resistance of any fuse be the important factor, fuses can be furnished to definite resistance tolerances, if specified. The additional cost of such controlled resistance will depend upon the tolerances required.

VOLTAGE RATING OF FUSES

The voltage rating of a fuse indicates the maximum voltage for which the fuse is designed and tested. A typical voltage rating might read "for 250 volts or less". This shows that the fuse may be used on circuits of ANY voltage up to 250. It will operate just as accurately on any circuit of lower voltage since it is the current in amperes flowing through the fuse that causes it to open, regardless of the circuit voltage.

The voltage rating is only important to indicate the highest voltage at which the fuse is tested to safely clear the circuit.

VIBRATION CHARACTERISTICS

To determine the vibration characteristics of BUSS and FUSETRON fuses, a costly Caladyne Vibration System has been installed.

This system permits the evaluation of the vibration characteristics of Small Dimension fuses at cycles of 5 to 2000 per second and acceleration levels up to 30g (vector) or with displacements up to 1/2 inch double amplitude.

Tests with this equipment have permitted great improvement in the designing of fuses to withstand vibration.

UNDERWRITERS' LABORATORIES LISTING

Where Underwriters' Laboratories listing is shown, this means that the fuse meets the requirements for special fuses contained in UL Standard No. 198.

MILITARY SPECIFICATIONS

Most BUSS fuses and Fuseholders are also available to meet the requirements of the Military Specifications. For more information ask for BUSS Bulletin covering products that meet such specifications.

SPECIAL FUSES, FUSE CLIPS, FUSE BLOCKS or FUSEHOLDERS

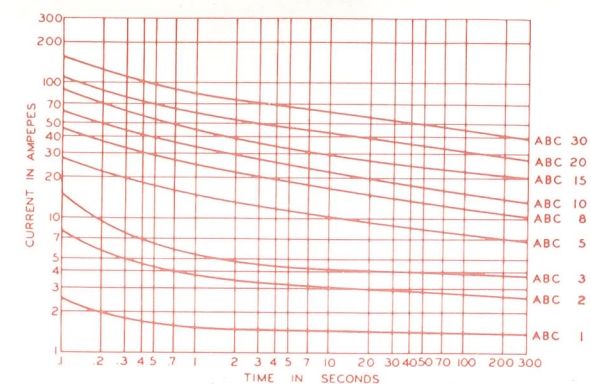
Sometimes a special fuse or fuse mounting not shown is required. In such cases, we welcome your requests either to quote — or to help in designing or selecting the special type of fuse or fuse mounting best suited to your particular conditions.

Submit description or sketch, showing type of fuse to be used, number of circuits, type of terminal, etc. If your protection problem is still in the engineering state, tell us current, voltage, load characteristics, etc.

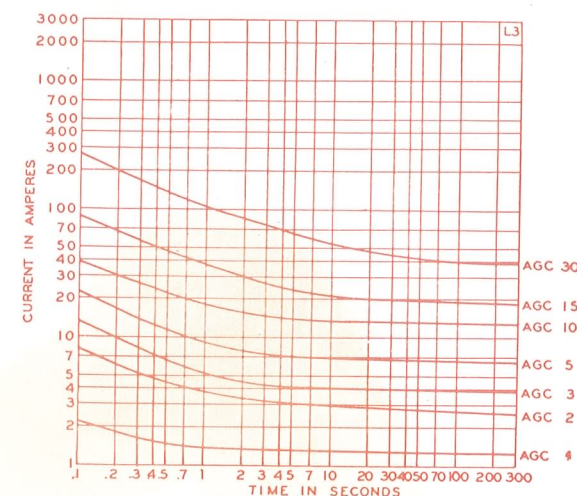
Be sure to get latest information BEFORE final design is crystallized.

Frequently, a standard fuse or fuse mounting that is readily available from local wholesalers' stocks can be adapted or modified to meet your exact requirements. This makes it possible for users of your equipment to easily obtain replacements.

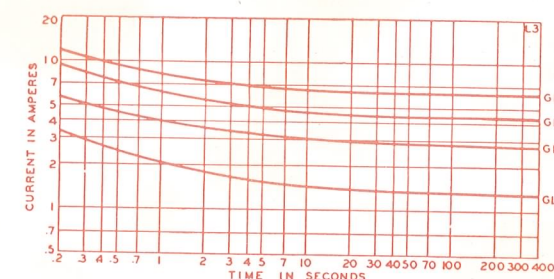
At any time our staff of fuse engineers is at your service to help solve your problems in electrical protection.



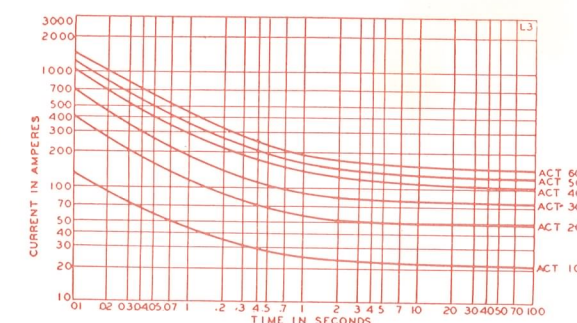
BUSS ABC Fuses 1/4 x 1 1/4 inch. Ceramic tube



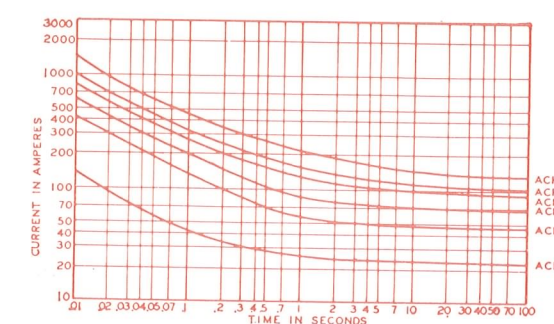
BUSS AGC and GJV Fuses 1/4 x 1 1/4 inch. Glass tube



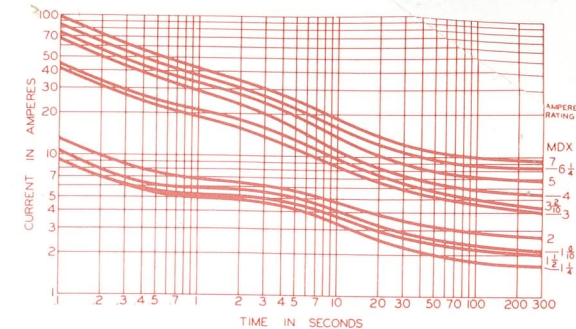
BUSS GLD Indicating Fuses 1/4 x 1 1/4 inch. Fibre tube



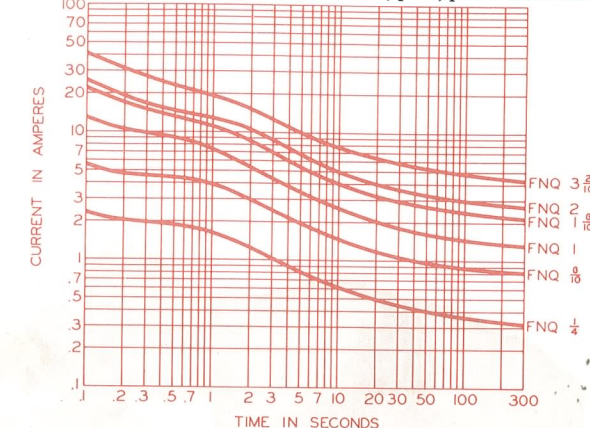
BUSS ACT and ACF Indicating Fuses Aircraft, Limiter type



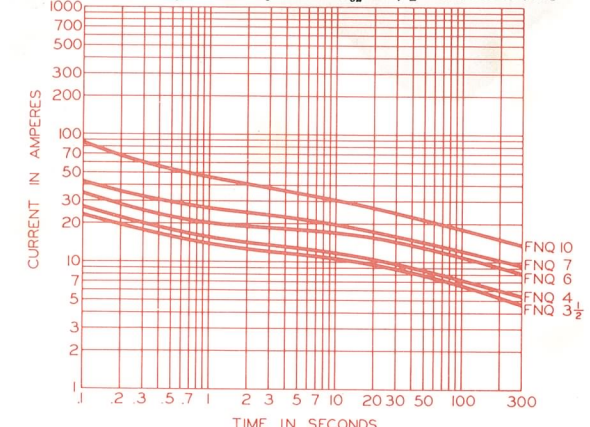
BUSS ACH Indicating Fuses Aircraft, Limiter type



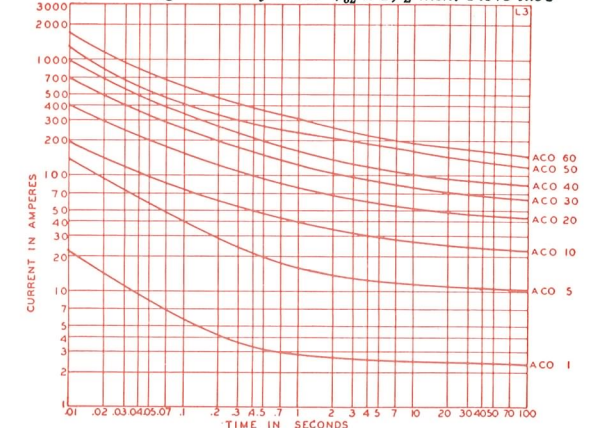
FUSETRON MDX dual-element Fuses 1/4 x 1 1/4 inch. Glass tube



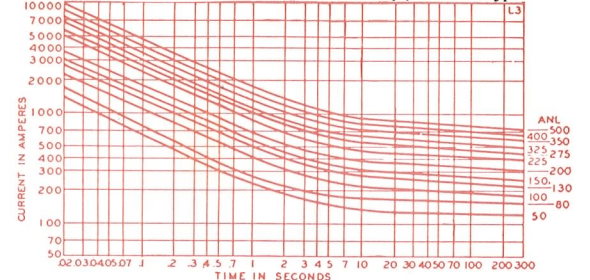
TRON FNQ time-delay Fuses 1 3/32 x 1 1/2 inch. Fibre tube



TRON FNQ time-delay Fuses 1 3/32 x 1 1/2 inch. Fibre tube



BUSS ACO Indicating Fuses Aircraft, Limiter type

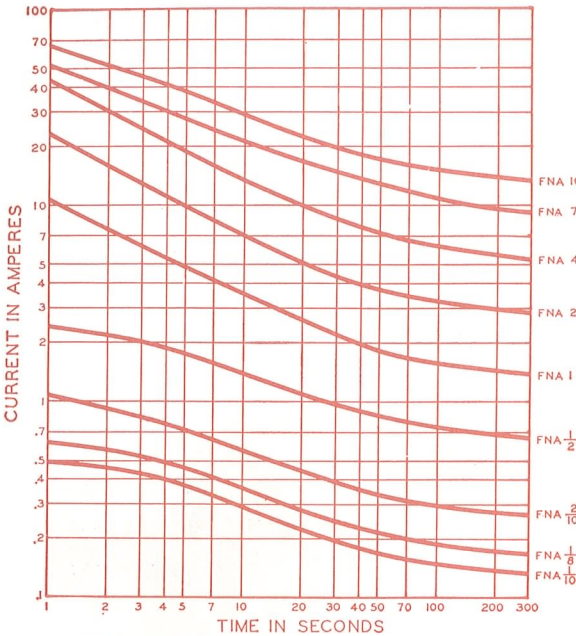


BUSS ANL Limiters

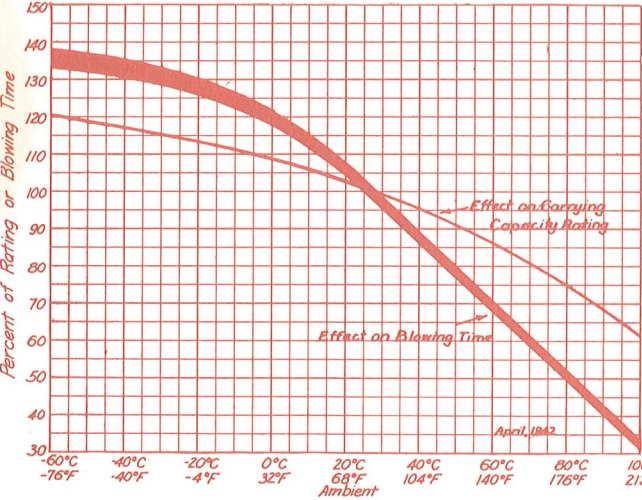
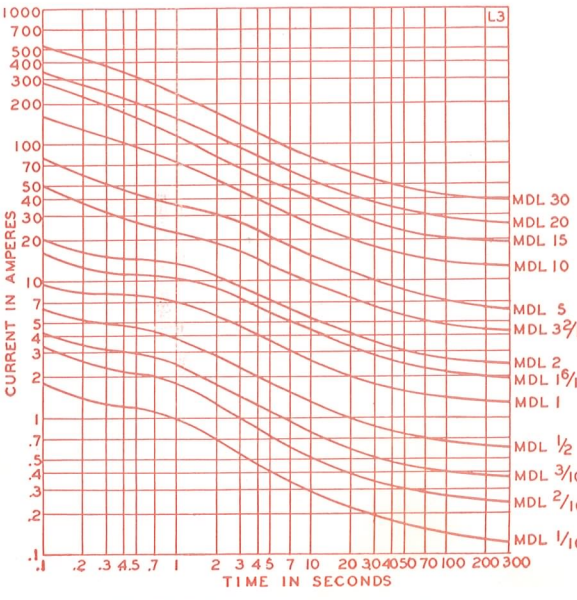
BLOWING TIME CHARTS ON FUSETRON Dual-Element FUSES AND BUSS FUSES

As a guide to help in the selection of the proper size and type of fuse these charts are given.

They indicate the time-current characteristics of FUSETRON and BUSS fuses.



It must be realized that the information given is only approximate — if more accuracy is needed for some specific problem in electrical protection tell us your requirements. Our fuse engineers are always at your service.



EFFECT OF AMBIENT TEMPERATURE ON OPERATING CHARACTERISTICS OF FUSETRON dual-element FUSES

Fusetron dual-element fuse ratings are based on an ambient temperature of 70° to 80° F.

Higher or lower ambient temperatures affect the carrying capacity as shown on the chart.

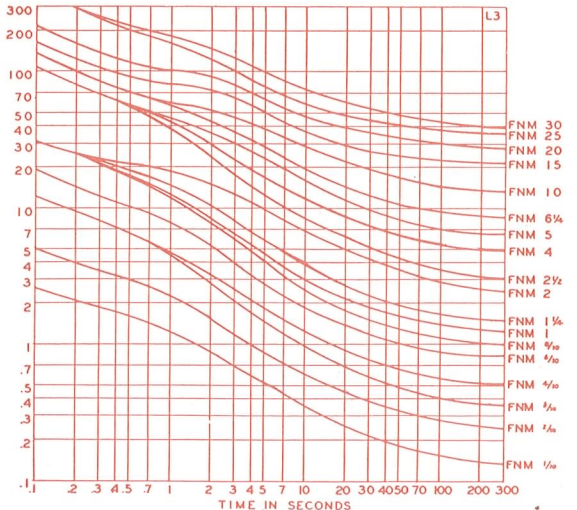
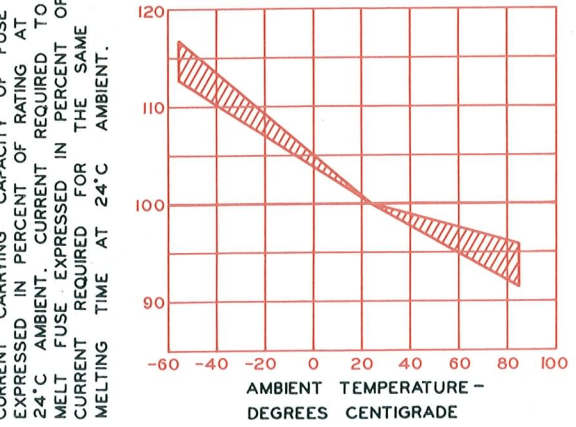
For instance, an ambient of 104° F. reduces the carrying capacity 5%.

On loads of 500% or less, ambients other than 70° to 80° affect the blowing time as shown on the chart.

It must be remembered that these figures are only approximate and that they would be affected by the condition of the clips and other contact conditions.

Chart #50564 effect of ambient temp. on all fuses (general statement).

AMBIENT TEMPERATURE EFFECT ON NORMAL OPENING FUSES



1/4 x 1 inch FUSES

BUSS FAST ACTING FUSES for PROTECTION OF INSTRUMENTS, etc.

1/4 x 1 inch. Glass tube Formerly called 8AG.



Provide high speed action necessary to protect sensitive instruments or delicate apparatus.

AGX 1/500 to 1/32 ampere sizes and MKB 1/16 and 1/8 ampere sizes have bridge construction. This prevents physical damage to delicate element from rough handling or vibration.

If resistance lower than shown for AGX fuses is desired use MKB fuses in equivalent sizes.

1/16 to 2 ampere sizes have straight through element. AGX fuses are listed by Underwriters' Laboratories, Inc.

Test specification — carry 100%, open at 200% within 5 seconds.

Voltage	Symbol	Amperes
250 or less	AGX	1/500, 1/200, 1/100, 1/32, 1/16, 1/10, 1/8, 3/16, 1/10, 1/4, 3/8, 1/2, 3/4, 1, 1 1/2 or 2
250 or less	MKB	1/16 or 1/8
	MJB & MJW	fuses now called AGX.

Carton quantity 5, shelf package 100. Shipping weight 0.76 lbs. per 100

Resistance of Fast-Acting Fuses

Symbol & Ampere Rating	Cold Resistance Approx. (ohms)	Hot Resistance Approx. (ohms)	Symbol & Ampere Rating	Cold Resistance Approx. (ohms)	Hot Resistance Approx. (ohms)
AGX 1/500	1260	1920	AGX 3/8	1.5	5.6
AGX 1/200	200	300	AGX 1/2	.92	3.3
AGX 1/100	102	186	AGX 3/4	.45	1.5
AGX 1/32	30	62	AGX 1	.31	1.2
AGX 1/16	30	91	AGX 1 1/2	.11	.16
AGX 1/8	8	21	AGX 2	.07	.11
AGX 1/4	2.3	8.3	MKB 1/16	4	8.4
			MKB 1/8	1.2	3.1

BUSS GLASS TUBE FUSES, 1/4 x 1 inch.



Test specification — carry 110%, open at 135% within 1 hour. 125 volt sizes listed by Underwriters' Laboratories, Inc.

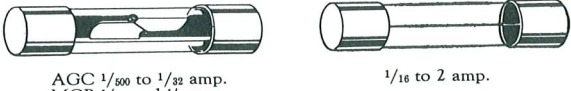
Voltage	Symbol	Amperes
125 or less	AGX	3, 4 or 5
32 or less	AGX	8, 10, 15, 20, 25 or 30

Carton quantity 5, shelf package 100. Shipping weight 0.76 lbs. per 100.

1/4 x 1 1/4 inch FUSES

BUSS FAST ACTING FUSES for PROTECTION OF INSTRUMENTS, etc.

1/4 x 1 1/4 inch. Glass tube. Formerly called 3AG.



Provide high speed action necessary to protect sensitive instruments or delicate apparatus.

AGC 1/500 to 1/32 ampere sizes and MGB 1/16 and 1/8 ampere sizes have bridge construction. This prevents physical damage to delicate element from rough handling or vibration.

1/16 to 2 ampere sizes have straight through element. Listed by Underwriters' Laboratories, Inc.

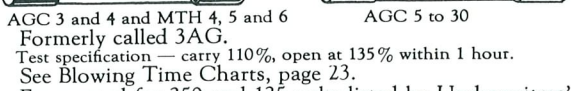
Test specifications — carry 110%, open at 135% in 1 hour or less. 1/500 to 2 ampere sizes also will open at 200% load in 5 seconds or less.

See Blowing Time Charts, page 23.

Voltage	Symbol	Amperes
250 or less	AGC	1/500, 1/200, 1/100, 1/32, 1/16, 1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/2, 2
250 or less	MGB	1/16 or 1/8
	MBW & MBB	fuses now called AGC.

Carton quantity 5, shelf package 100. Shipping weight 0.91 lbs. per 100.

BUSS GLASS TUBE FUSES, 1/4 x 1 1/4 inch



Formerly called 3AG. Test specification — carry 110%, open at 135% within 1 hour. See Blowing Time Charts, page 23.

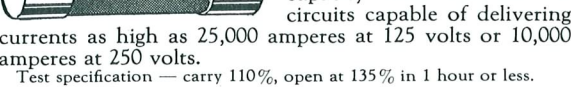
Fuses rated for 250 and 125 volts listed by Underwriters' Laboratories, Inc.

Voltage	Symbol	Amperes
250 or less	AGC	2 1/2, 3
250 or less	MTH	4, 5 or 6
125 or less	GLH	8 or 10
32 or less	AGC	4, 5, 6, 7 1/2, 8, 10, 15, 20, 25 or 30

Sizes larger than 30 ampere are not recommended as clips or fuseholders would not permit fuse to carry such high currents. If surges or starting currents make heavier fuse necessary, use MDL FUSETRON dual-element fuses.

Carton quantity 5, shelf package 100. Shipping weight 0.91 lbs. per 100.

BUSS MELAMINE TUBE FUSES, 1/4 x 1 1/4 inch



These are high interrupting capacity fuses for use on circuits capable of delivering currents as high as 25,000 amperes at 125 volts or 10,000 amperes at 250 volts.

Test specification — carry 110%, open at 135% in 1 hour or less.

Voltage	Symbol	Amperes
250 or less	MBO	1, 2, 3, 4, 5, 6, 8, 10 or 15
125 or less	MBO	20, 25 or 30

Carton quantity 5, shelf package 100. Shipping weight 0.93 lbs. per 100.

BUSS CERAMIC TUBE FUSES, 1/4 x 1 1/4 inch



These are high interrupting capacity fuses for use on circuits capable of delivering currents as high as 25,000 amperes at 125 volts or 10,000 amperes at 250 volts.

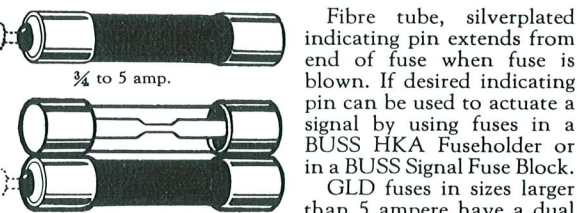
Test specification — carry 110%, open at 135% within 1 hour. See Blowing Time Charts, page 23.

Listed by Underwriters' Laboratories, Inc., 15 amps. and less.

Voltage	Symbol	Amperes
250 or less	ABC	1/4, 1, 2, 3, 5, 6, 8, 10, 12, 15 or 20
125 or less	ABC	25 or 30

Carton quantity 5, shelf package 100. Shipping weight 1 lb. per 100.

BUSS INDICATING FUSES, 1/4 x 1 1/4 inch



Fibre tube, silverplated indicating pin extends from end of fuse when fuse is blown. If desired indicating pin can be used to actuate a signal by using fuses in a BUSS HKA Fuseholder or in a BUSS Signal Fuse Block.

GLD fuses in sizes larger than 5 ampere have a dual tube construction. They can be used in BUSS Signal fuse blocks but not in the HKA fuseholder.

125 volt sizes listed by Underwriters' Laboratories, Inc. Test specification — carry 110%, open at 135% in 1 hour or less.

Voltage	Symbol	Amperes
125 or less	GLD	3/4, 1, 1 1/2, 2, 3, 4 or 5
32 or less	GLD	6, 8, 10, 12, 15, 20, 25 or 30

IBM now called GLD. 0 to 5 amp. Carton quantity 5. Shipping weight 0.86 lbs. per 100. 8 to 15 amp. Carton quantity 5. Shipping weight 1.75 lbs. per 100.

GBA FUSES

GBA fuses are the same as BUSS GLD fuses EXCEPT that the indicating pin is RED. This results in a more vivid indication of an open fuse when the fuses are used in BUSS HLD fuseholders.


GBA fuses have same electrical and physical characteristics as BUSS GLD fuses and are made in the same ampere sizes up to 5 ampere. These sizes are listed by the Underwriters' Laboratories, Inc.

To specify: give symbol GBA and amperes.

CURRENT CARRYING CAPACITY OF FUSE EXPRESSED IN PERCENT OF RATING AT 24° C AMBIENT. CURRENT REQUIRED TO MELT FUSE EXPRESSED IN PERCENT OF CURRENT REQUIRED FOR THE SAME MELTING TIME AT 24° C AMBIENT.

1/4 x 1 1/4 inch FUSES (continued)

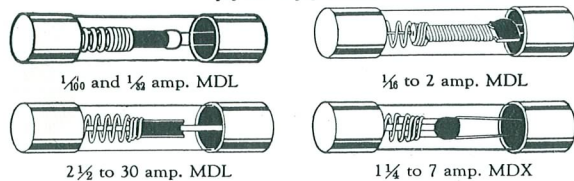
FUSETRON CERAMIC TUBE FUSES, 1/4 x 1 1/4 inch DUAL-ELEMENT — SLOW BLOWING TYPE

		Test specification — carry 110%, open at 135% within 1 hour.	
Voltage	Symbol	Amperes	
250 or less	MDA	1/100, 1/32, 1/16, 1/10, 1/8, 15/100, 1/1000, 3/16, 2/10, 1/4, 3/10, 3/8, 1/2, 6/10, 3/4, 8/10, 1, 1 1/4, 1 1/2, 1 3/4, 2, 2 1/2, 2 3/4, 3, 3 3/4, 4, 5, 6 1/4, 7, 8, 10, 15 or 20	
125 or less	MDA	25 or 30	
Carton quantity 5, shelf package 100. Shipping weight 0.97 lbs. per 100			

FUSETRON MELAMINE TUBE FUSES

Type **MDF**. These fuses are same as fuses **MDL** and **MDX** below, and come in same sizes except they have a Melamine tube.

FUSETRON GLASS TUBE FUSES, 1/4 x 1 1/4 inch



DUAL-ELEMENT — SLOW BLOWING TYPE

These fuses avoid needless blows from starting currents or surges. They have a fuse link which operates only on very high overloads or short-circuits — they have a thermal cutout which functions on low overloads — the thermal cutout cannot operate quickly at any load, hence long time-lag is obtained. Yet protection is afforded against short-circuits or continued overloads.

Test specification — carry 110%, open at 135% within 1 hour.

See Blowing Charts, pages 22 & 23.

MDL 0 to 2 3/10 amperes and MDX 0 to 7 amperes listed by Underwriters' Laboratories, Inc. MDL fuses have longer time-lag than MDX fuses.

Voltage	Symbol	Amperes
250 or less	MDL	1/100, 1/32, 1/16, 1/10, 1/8, 15/100, 1/1000, 3/16, 2/10, 1/4, 3/10, 3/8, 4/10, 1/2, 6/10, 3/4, 8/10 or 1
250 or less	MDX	1 1/4, 1 1/2, 1 3/4 or 2
125 or less	MDL	1 3/10, 1 1/4, 1 1/2, 1 3/4, 2, 2 1/2, or 2 3/10
125 or less	MDX	3, 3 3/10, 4, 5, 6 1/4 or 7
32 or less	MDL	3, 3 3/10, 4, 5, 6 1/4, 8, 10, 15, 20, 25 or 30
Carton quantity 5, shelf package 100. Shipping weight 0.93 lbs. per 100		

PIG-TAIL FUSES

FUSETRON PIG-TAIL FUSES

DUAL-ELEMENT — SLOW BLOWING TYPE

Test specifications and performance, MDV 1/100 to 2 3/10 ampere same as MDL fuses. 3 to 7 ampere same as MDX fuses.

1/4 x 1 1/4 inch glass tube with 1 1/4 inch leads of No. 20 tinned wire.

Listed by Underwriters' Laboratories, Inc.

Voltage	Symbol	Amperes
250 or less	MDV	1/100, 1/32, 1/16, 1/10, 1/8, 15/100, 1/1000, 3/16, 2/10, 1/4, 3/10, 3/8, 4/10, 1/2, 6/10, 3/4, 8/10 or 1
125 or less	MDV	1 1/4, 1 1/2, 1 3/4, 2, 2 1/2, 2 3/10, 3, 3 3/10, 4, 5, 6 1/4 or 7

Packed 5 in a metal box, 100 in a shelf package. Shipping weight 1.1 lbs. per 100.

BUSS PIG-TAIL FUSES

1/4 x 1 1/4 inch glass tube fuse with 1 1/4 inch leads of No. 20 tinned wire.

Test specifications — carry 110%, open at 135% in one hour or less.

Listed by Underwriters' Laboratories, Inc.

Voltage	Symbol	Amperes
250 or less	GJV	1/16, 1/8, 1/4, 3/10, 3/8, 1/2, 3/4, 1, 1 1/2, 2, 3, 4, 5, or 6

Fuses packed 5 in metal box — 100 in shelf package. Shipping weight 0.9 lbs. per 100.

9/32 x 1 1/4 inch FUSES

BUSS GLASS TUBE FUSES, 9/32 x 1 1/4 inch



Formerly called 4AG

Test specification — carry 110%, open at 135% within 1 hour except 35 and 40 ampere which open at 300% in 2 to 4 seconds when tested in a standard 30 ampere test circuit.

Voltage	Symbol	Amperes
250 or less	AGS	1/16, 1/8, 1/4 or 1/2
		1, 2, 2 1/2 or 3
32 or less	AGS	5, 10, 15, 20, 25, 30, 35, 40 or 50

These fuses in sizes larger than 30 ampere are not recommended as clips or fuseholders will not permit the fuse to carry such high currents. If surges or starting currents make heavier fuse necessary, use MDM Fusetron fuses.

Carton quantity 5, shelf package 100. Shipping weight 1.2 lbs. per 100.

BUSS CERAMIC TUBE FUSES, 9/32 x 1 1/4 inch



Formerly called 4AB

Test specification — carry 110%, open at 135% within 1 hour except 35 and 40 ampere which open at 300% in 2 to 4 seconds when tested in a standard 30 ampere test circuit.

Voltage	Symbol	Amperes
250 or less	ABS	1, 2, 3, 5, 8, 10, 15 or 20
125 or less	ABS	25 or 30
32 or less	ABS	35 or 40

These fuses in sizes larger than 30 ampere are not recommended as clips or fuseholders will not permit the fuse to carry such high currents. If surges or starting currents make heavier fuse necessary, use MDM Fusetron fuses.

Carton quantity 5, shelf package 100. Shipping weight 1.2 lbs. per 100.

FUSETRON GLASS TUBE FUSES, 9/32 x 1 1/4 inch



DUAL-ELEMENT — SLOW BLOWING TYPE

These fuses avoid needless blows from starting currents or surges. They have a fuse link which operates only on very high overloads or short-circuits — they have a thermal cutout which functions on low overloads — the thermal cutout cannot operate quickly at any load, hence long time-lag is obtained. Yet protection is afforded against short-circuits or continued overloads.

Test specification — carry 110%, open at 135% within 1 hour. Approximate blowing time: at 200% load 25 seconds.

at 300% " 8 "

at 500% " 3 "

Voltage	Symbol	Amperes
250 or less	MDM	1/10, 15/100, 2/10, 1/4, 3/10, 4/10, 1/2, 3/10, 3/4, 8/10 or 1
125 or less	MDM	1 1/4, 1 1/2, 2, 2 1/2, 2 3/10 or 3
32 or less	MDM	3 3/10, 4, 5, 6 1/4, 8, 10, 15, 20, 25, 30, 35, or 40

Carton quantity 5, shelf package 100. Shipping weight 1.2 lbs. per 100.

FUSETRON CERAMIC TUBE FUSES, 9/32 x 1 1/4 inch

DUAL-ELEMENT — SLOW BLOWING TYPE



Test specifications and performance same as MDM fuses.

Voltage	Symbol	Amperes
250 or less	MDC	1/10, 15/100, 2/10, 1/4, 3/10, 4/10, 1/2, 3/10, 3/4, 8/10 or 1
125 or less	MDC	1 1/4, 1 1/2, 2, 2 1/2 or 2 3/10
32 or less	MDC	3, 3 3/10, 4, 5, 6 1/4, 8, 10, 15, 20, 25 or 30

Carton quantity 5, shelf package 100. Shipping weight 1.25 lbs. per 100.

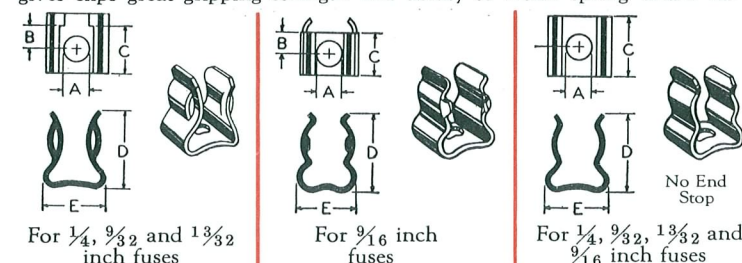
TRON FUSE CLIPS

Clips are made of a bronze of distinctly superior quality. This metal gives clips great gripping strength and ability to retain spring under ad-

verse conditions.

Beryllium copper is by far the most satisfactory metal yet discovered for use in fuse clips. It has the ability to retain spring pressure better than any other metal. It also has exceedingly high electrical conductivity.

Clips are Albaloy plated as this alloy plating is very resistant to corrosion and has a high conductivity.

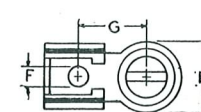


For Fuses with a DIAMETER of	A Size of Mounting hole	B Center of hole to back-stop	C Min. length of Contact Surface	D Maximum Height	E Maximum Width	Material	Finish	New No.	Former No.	Shpg. Weight per 100
1/4 inch For loads above 20 amperes, Beryllium Copper Clips are recommended.	.130 to .135	□.125 to .135	.250	.430	.335	Spring bronze Beryllium copper	Albaloy plated Silver plated	5682-44	4548	.3 lb.
	.130 to .135	Δ.099 to .109	.250	.430	.335	Spring bronze Beryllium copper	Albaloy plated Silver plated	5682-02	4592	.3 "
Clip without End Stop	.130 to .135	†	.265	.430	.335	Spring bronze	Albaloy plated	5682-41	4503	.3 "
9/32 inch	.170 to .175	□.172 to .182	.360	.525	.385	Spring bronze Beryllium copper	Albaloy plated Silver plated	5682-01	4440	.3 "
	.170 to .175	†	.358	.525	.385	Spring bronze	Albaloy plated	5681-15	3781	.3 "
Clip without End Stop	.170 to .175	†	.358	.525	.385	Spring bronze Beryllium copper	Albaloy plated Silver plated	5674-41	4550	.5 "
13/32 inch	.170 to .175	□.196 to .206	.383	.743	.464	Spring bronze Beryllium copper	Albaloy plated Silver plated	5674-01	4593	.5 "
	.193 to .199	Δ.164 to .174	.378	.743	.464	Spring bronze Beryllium copper	Albaloy plated Silver plated	5672-11	4437	.7 "
Clip without End Stop	.170 to .175	†	.307	.743	.464	Spring bronze Beryllium copper	Albaloy plated Silver plated	5960-63	4551	.7 "
9/16 inch	.170 to .175	†.247 to .257	.500	.937	.666	Spring bronze	Albaloy plated	5960-09	4594	.6 "
	.170 to .175	†	.500	.937	.666	Spring bronze	Albaloy plated	5960-61	4462	.7 "
Clip without End Stop	.170 to .175	†	.500	.937	.666	Spring bronze	Albaloy plated	5960-07	4464	.6 "
Clip without End Stop	.170 to .175	†	.500	.937	.666	Spring bronze	Dipped finish	5956-16	4243	.5 "
	.170 to .175	†	.500	.937	.666	Spring bronze	Dipped finish	5591-42	4570	1.4 "
Clip without End Stop	.170 to .175	†	.500	.937	.666	Spring bronze	Albaloy plated	5591-52	4569	1.4 "
	.170 to .175	†	.500	.937	.666	Spring bronze	Dipped finish	5592-33	4212	1.2 "

□ Hole in center of contact area. Δ Hole in center of clip. † Hole in center of both clip and contact area.

Carton quantity, all clips: 10

BUSS CLIP ASSEMBLIES

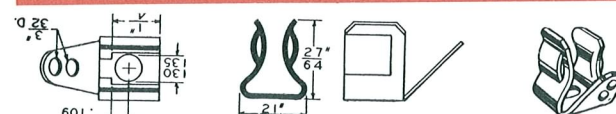


Assembly consists of clip, brass terminal base, and screws as shown in table.

Carton quantity, all clip assemblies: 10.

For Fuses with a DIAMETER of	New Clip No.	Former Clip No.	Mounting Screw	Terminal Screw	F Size of mount'g hole	G C to Cm't'g hole & term'l screw	H Diameter of terminal	Assembly No.	Shipping Weight per 100
1/4 inch For loads above 20 amperes, Beryllium Copper Clips are recommended.	5682-44	4548	4-40, 1/4 inch Steel flat head	6-32, 3/16 inch Brass washer head	.088 to .090	.355 to .360	.375 to .380	4431	1 lb.
	5682-02	4592	"	"	.130 to .135	"	"	4432	
9/32 inch	5682-44	4548	None	"	"	"	"	4567	1.6 "
	5682-02	4592						4583	
13/32 inch	5674-41	4550	"	"	"	"	"	4560	1.6 "
	5674-01	4593						4585	
9/16 inch	5960-63	4551	"	"	"	"	"	4561	2.7 "
	5960-09	4594						4586	
9/16 inch	5591-42	4570	"	"	"	.568 to .573	.505 to .515	4208	2.7 "
	5591-52	4569						4207	

BUSS ONE-PIECE CLIP AND TERMINAL



No. 5678-14 (Formerly called 4051) one-piece clip and solder type terminal for 1/4 inch fuse.

Spring bronze, albaloy plated, shipping weight .3 lbs. per 100. Carton quantity: 10.

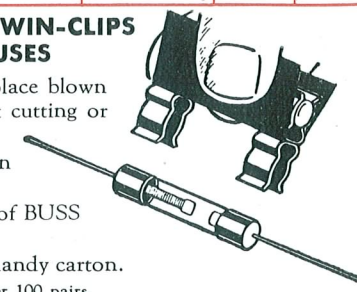
BUSS Insulated TWIN-CLIPS for 1/4" FUSES

Make it easy to replace blown pig-tail fuses without cutting or unsoldering pig-tails.

Twin-Clips snap on blown fuse.

No. 3434 One pair of BUSS Twin-Clips.

Packed 5 pair in a handy carton. Shipping Wt. 1.0 lbs. per 100 pairs.



13/32 x 1 3/8 inch FUSES

BUSS BBS FUSES

600 Volt. UL Listed 13/32 x 1 3/8 inch.

Fibre tube. Designed for the protection of control circuits or wherever a fuse with "quick-blowing" characteristics is desirable.

Listed by the Underwriters' Laboratories, Inc.

Voltage Symbol Amperes
600 or less BBS 1/10, 1/4, 8/10, 1, 2, 3, 4 or 5

These fuses can be used in BUSS HPC-L fuseholder, or in BUSS No. 3845 fuse block.

BUSS KTQ FUSE

KTQ fuses have been specifically engineered for use in mercury vapor fixture circuits. KTQ fuses have an interrupting rating of 10,000 amperes at 600 volts and are designed to override ballast inrush current while still opening quickly on short circuits.

Voltage Symbol Amperes
600 or less KTQ 2, 3, 4, 5.

These 13/32 x 1 3/8" fuses will fit BUSS HPC-L fuseholders, or BUSS No. 3845 fuse blocks.

1/4 x 5/8 inch FUSES

BUSS GLASS TUBE FUSES, 1/4 x 5/8 inch



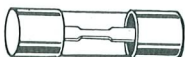
Formerly called 1AG

Test specification — carry 110%, open at 135% within 1 hour.

Voltage Symbol Amperes
32 or less AGA 1, 1 1/2, 2, 3, 5, 6, 7 1/2, 10, 15, 20, 25 or 30
Carton quantity 5, shelf package 100. Shipping weight 0.73 lbs. per 100.

1/4 x 7/8 inch FUSES

BUSS GLASS TUBE FUSES, 1/4 x 7/8 inch



Formerly called 7AG

Test specification — carry 110%, open at 135% within 1 hour.

Voltage Symbol Amperes
32 or less AGW 2 1/2, 4, 6, 7 1/2, 15, 20 or 30
Carton quantity 5, shelf package 100. Shipping weight 0.80 lbs. per 100.

MINIATURE FUSES

BUSS MINIATURE GLASS TUBE FUSES

5 mm x 20 mm (.197 x .769 inches)



GJU fuses now called GMA.

Designed for protection of miniaturized circuits or equipment. Commonly used in equipment of foreign make.

Test specifications — Carry 100% load indefinitely.

Open at 200% load within 10 seconds

Voltage Symbol Amperes
125 volts or less { GMA 1/8, 1/4, 1/2, 3/10, 1, 1 1/10, 1 1/2,
if available fault current is not over 50 amps. { 2, 3, 4, 5, 6, 10.

Carton quantity 5, shelf package 100. Shipping weight 0.69 lbs. per 100.

GMW Fuse and HWA Fuseholder

Sub-miniature fuse-holder combination

Body size of fuse only .270 x .250 inches. Diameter of holder body .375 inches.



Symbol
GMW

HWA

AF

Offering a space-saving protective device for space-tight applications in multiple circuit apparatus. GMW fuse has transparent window for visual inspection of element. Fuse may be used alone for mounting into printed circuit boards.

HWA holder can be panel mounted easily — or soldered on printed circuit boards.

AF knob for holder makes holder water-proof from front of panel.

Test specifications — carry 100%, open at 200% within 10 seconds or less.

Interrupting rating — 300 ampere at 125 volts.

Ampere

1/200, 1/100, 1/64, 1/32, 1/16, 1/10, 2/10, 1/4,

3/10, 1/2, 3/10, 1/4, 1, 1 1/2, 2, 3, 4, and 5

For military type specify FM01 and ampere rating.

Carton quantity 10. Shipping weight 0.20 lbs. per 100.

Fuseholder takes all sizes of GMW fuses

For military type specify FHN42W.

Carton quantity 10. Shipping Weight 0.44 lbs. per 100.

Knob for HWA fuseholder

Carton quantity 10. Shipping weight 0.25 lbs. per 100.

SFE STANDARD FUSES

BUSS FUSES — SFE STANDARD

All cuts actual size. Fuses of different amperages are of different lengths — to make it impossible to insert too large a size — thereby preventing over-fusing.



SFE 4



SFE 6



SFE 7 1/2 & SFE 9



SFE 14



SFE 20



SFE 30

Glass tube — diameter 1/4 inch. Length as per table below.

Test specification — carry 110%, open at 135% within 1 hour.

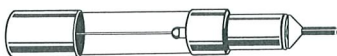
Listed by Underwriters' Laboratories, Inc.

Made according to SAE specifications.

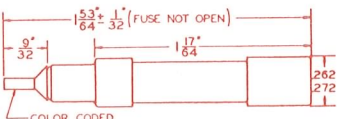
Voltage	Symbol & Amperes	Length Inches	Shipping Weight Lbs. Per 100
32 or less	SFE4	5/8	0.73
"	SFE6	3/4	0.75
"	SFE7 1/2	7/8	0.80
"	SFE9	7/8	0.80
"	SFE14	1 1/16	0.82
"	SFE20	1 1/4	0.87
"	SFE30	1 7/16	1.60

All SFE fuses, carton quantity 5, shelf package 100.

BUSS Series 70 FUSES



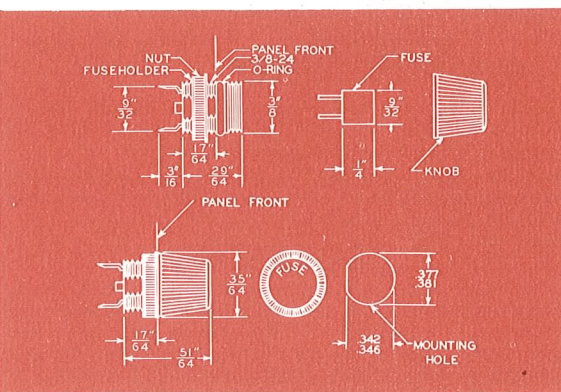
Signal-Indicating Alarm-Activating



For use in telephone and similar applications. Color coded indicating pin extends from end when fuse opens. Glass tube construction permits visual check of element. Fuse rated 300v, carry rated current minimum 10 minutes. For opening time-current characteristics, see table.

Number & Type	Ampere Rating	Color Code	At 150% of rating open in:
70 E	18/100	Yellow	0 to 90 Sec.
70 X	2/10	Black	90 to 300 "
70 F	1/4	Violet	0 to 90 "
70 K	1/4	Violet & White	90 to 300 "
70 G	1/2	Red	0 to 90 "
70 H	3/4	Tan	0 to 90 "
70 P	1	Pink	90 to 300 "
70 A	1 1/2	White	0 to 90 "
70 B	2	Orange	0 to 90 "
70 C	3	Blue	0 to 90 "
70 D	5	Green	0 to 90 "
71 A	6	Green & White	0 to 90 "
70 M	8	Red & White	0 to 90 "
70 R	10	Purple	0 to 90 "

Carton quantity 10, Shipping weight 1 lb. per 100

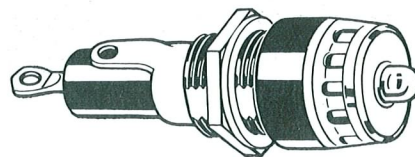


When tooling up for mounting holder, get latest blueprint.

BUSS Panel Mounted FUSEHOLDERS

Visual-Indicating Series HLD

For 1/4 x 1 1/4 inch BUSS GBA fuses (or GLD fuses) 3/4 to 5 amps.



Holder has bayonet type transparent knob. This permits visual indicating pin on an open BUSS GBA fuse to be seen.

BUSS GBA indicating fuse has red headed indicating pin that shows up clearly when fuse is open.

(BUSS GLD fuses up to 5 amps. may also be used in HLD holder, but because of silvered head on indicating pin they will not indicate open fuse as clearly as the BUSS GBA fuse.)

Knob of HLD holder grips fuse tightly and pulls fuse from holder when knob is removed.

Side terminal is held mechanically as well as by solder. Heat of soldering cannot cause it to loosen or come off.

Vibration will not cause failure of terminals as they are designed to withstand severe service.

Neoprene washer and zinc plated, chromate dipped steel fastening nut furnished with each holder.

Body is of molded black phenolic.

Flat part of body locks it against rotation when used in punched hole — or permits use of a locking key in drilled holes.

Locking keys are obtainable, without charge — 1/16 inch long for panels up to 1/8 inch thick or 1/8 inch long for thicker panels. Specify length wanted.

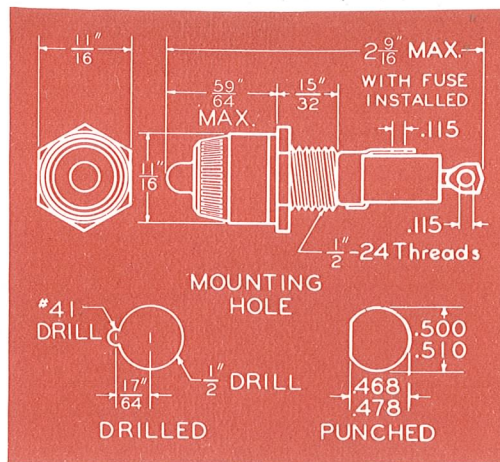
The BUSS HLD fuseholder when used with BUSS GBA (or GLD) fuses is designed for circuits of 125 volts or less. Quick-connect terminals also available — specify HLD-HH.

Listed by Underwriters' Laboratories, Inc. for 15 ampere rating for any voltage up to 250.

Symbol
HLD for 1/4 x 1 1/4 inch GBA Indicating fuses in ratings of 3/4 to 5 ampere.

Carton quantity 10.

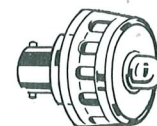
Shipping weight 3 1/4 lbs. per 100.



When tooling up for mounting get latest blue print

Knob of HLD holder can be used to make your HKP holders indicating type

Present HKP holders can readily be changed into visual indicating type holders, simply by replacing the HKP knob with a transparent knob such as is used on HLD holders.

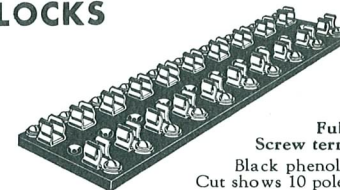


To order specify: Transparent Knob No. 5487.

BUSS STANDARD FUSE BLOCKS

Available from 1 to 12 poles. Have laminated black phenolic base. Clips of strong spring bronze, albaloy plated, highly resistant to corrosion with great gripping strength. Types 3823 and 3828 have soldered terminals on small base. Mounting holes are straight for No. 6 screw. Type 3833 has screw terminals on full base that provides ample insulation around terminals. Mounting holes are countersunk for No. 6 screw.

BUSS standard fuse blocks available with quick-connect terminals.

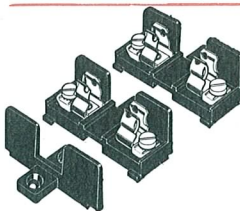


Full base, screw terminals, black phenolic base. Cut shows 10 pole block.

For 1/4 x 1 1/4" Fuses — Solder Terminals			For 1/4 x 1" Fuses — Solder Terminals			For 1/4 x 1 1/4" Fuses — Screw Terminals		
Type	Base Dimension	No. Poles	Type	Base Dimension	No. Poles	Type	Base Dimension	No. Poles
3823-1	1/2 x 1 5/8	1	3828-1	1/2 x 1 3/8	1	3833-1	25/32 x 2 3/8	1
3823-2	1 1/8 x 1 5/8	2	3828-2	1 1/8 x 1 3/8	2	3833-2	1 11/16 x 2 3/8	2
3823-3	1 3/4 x 1 5/8	3	3828-3	1 3/4 x 1 3/8	3	3833-3	2 19/32 x 2 3/8	3
3823-4	2 3/8 x 1 5/8	4	3828-4	2 3/8 x 1 3/8	4	3833-4	3 1/2 x 2 3/8	4
3823-5	3 x 1 5/8	5	3828-5	3 x 1 3/8	5	3833-5	4 13/32 x 2 3/8	5
3823-6	3 5/8 x 1 5/8	6	3828-6	3 5/8 x 1 3/8	6	3833-6	5 5/16 x 2 3/8	6
3823-7	4 1/4 x 1 5/8	7	3828-7	4 1/4 x 1 3/8	7	3833-7	6 7/32 x 2 3/8	7
3823-8	4 7/8 x 1 5/8	8	3828-8	4 7/8 x 1 3/8	8	3833-8	7 1/8 x 2 3/8	8
3823-9	5 1/2 x 1 5/8	9	3828-9	5 1/2 x 1 3/8	9	3833-9	8 1/32 x 2 3/8	9
3823-10	6 1/8 x 1 5/8	10	3828-10	6 1/8 x 1 3/8	10	3833-10	8 15/16 x 2 3/8	10
3823-11	6 3/4 x 1 5/8	11	3828-11	6 3/4 x 1 3/8	11	3833-11	9 27/32 x 2 3/8	11
3823-12	7 3/8 x 1 5/8	12	3828-12	7 3/8 x 1 3/8	12	3833-12	10 3/4 x 2 3/8	12

BUSS Add-On FUSE BLOCKS

For 13/32 x 1 1/2 inch Fuses



With BUSS Add-On fuse blocks it is easy to make up a fuse block of any number of poles.

Each single pole unit is simply nested against the next one and locked in position by a single screw so that the whole assembled block becomes a single unit that seats flat and firm, no matter how many poles are added.

New poles can be added to either end of the existing block. There are no retaining rods or mounting channel straps to remove, cut or modify when adding poles.

Listed by Underwriters' Laboratories, Inc. for 30 ampere rating at any voltage up to 600.



Each fuse can be used as a circuit disconnect.

Marking strips are available that snap-lock onto base. Strips can be marked with circuit number and proper fuse or identified in other manner.

3742 End Barrier Only

3743 One-Pole Block Only

Marking Strip in 50 inch lengths

When ordering, be sure to specify number of End Barriers and number of One-Pole Blocks desired. Only ONE End Barrier is required for each assembled fuse block of any number of poles.

TRON RECTIFIER FUSES

For Protection of Semi-Conductor Rectifiers and Like Applications

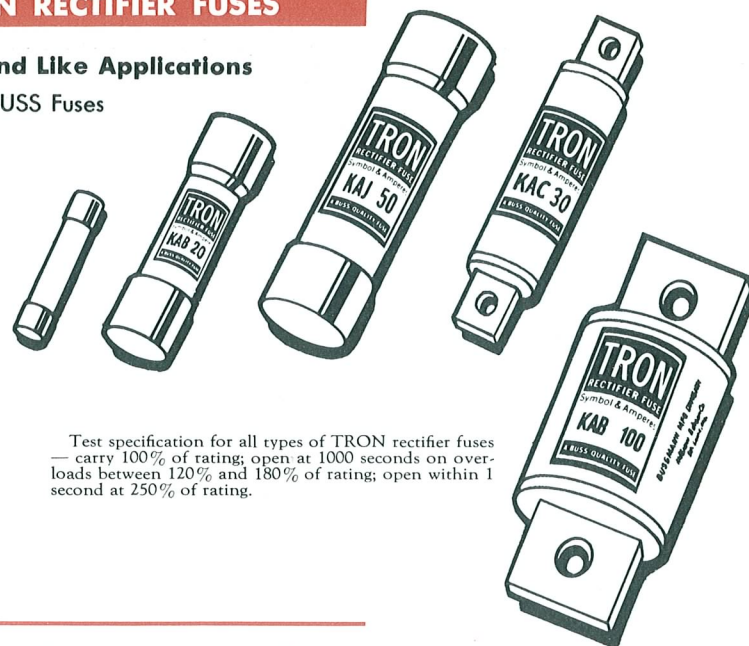
Another Outstanding Development by the Makers of BUSS Fuses

These TRON fuses are especially designed for the protection of semi-conductor rectifiers, SCR's, Thyristors, Solid State Devices or wherever a very fast acting fuse is needed. They provide extremely fast opening on overload and fault currents, with a high degree of restriction of the let-thru current.

If each diode is protected by a TRON fuse, the fuse will open very quickly when the current drawn exceeds the rating of the diode.

Thus when a short-circuit occurs in a diode the fuse opens and takes that diode out of the circuit. This protects other good diodes in the rectifier which might otherwise be damaged.

Write for time-current characteristic charts.



Test specification for all types of TRON rectifier fuses — carry 100% of rating; open at 1000 seconds on overloads between 120% and 180% of rating; open within 1 second at 250% of rating.

Dimensions of TRON Rectifier Fuses

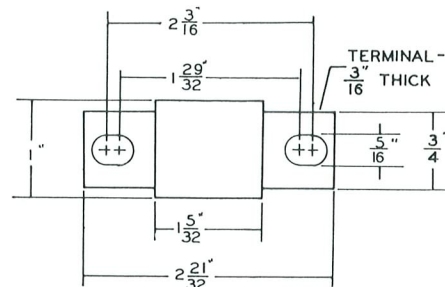
For 130 volts or less

Voltage	Symbol	Ampere
130 or less	GBB	1, 1 1/4, 2, 3, 4, 5, 6, 7, 8, 9 or 10.
65 or less	GBB	12, 15, 20, 25 or 30.

Carton quantity 5.
Shipping weight 1 lb. per 100.

Voltage	Symbol	Ampere
130 or less	KAA	1/2, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 15, 20, 25 or 30.
130 or less	KAW	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 15, 20, 25 or 30.

Carton quantity 10.
Shipping weight 1 1/4 lbs. per 100.

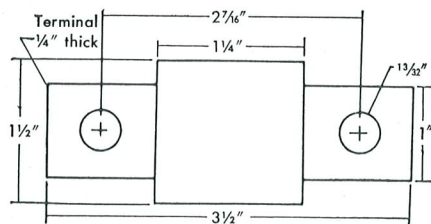


Voltage	Symbol	Ampere
130 or less	KAA	70, 80, 90, 100, 125, 150, 200, 225, 250, 300, 350 or 400.

Carton quantity 10.
Shipping weight 21 1/2 lbs. per 100.

Voltage	Symbol	Ampere
130 or less	KAH	35, 40, 45, 50 or 60.

Carton quantity 10.
Shipping weight 8 3/4 lbs. per 100.



Voltage	Symbol	Ampere
130 or less	KAA	450, 500, 600, 650, 800 or 1000.

Carton quantity 10. Shipping weight 60 lbs. per 100.

For 250 volts or less

Voltage	Symbol	Ampere
250 or less	KAB or KAX	1/2, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 15, 17 1/2, 20, 25 or 30.

Carton quantity 10.
Shipping weight 3 1/2 lbs. per 100.

Voltage	Symbol	Ampere
250 or less	KAB or KAX	35, 40, 45, 50 or 60.

Carton quantity 10. Shipping weight 12 lbs. per 100.

Continued Next Page

BUSS Panel Mounted FUSEHOLDERS

Lamp Indicating Series HG for Military Types FHL10U, FHL11U, FHL12U

For 1/4 x 1 1/4 and 1 3/32 x 1 1/2 inch Fuses

Transparent knob permits indicating light to be readily seen.

Fuses are held in beryllium copper fuse clips on a fuse carrier.

Fuse carrier slides into holder and locks in with bayonet type knob.

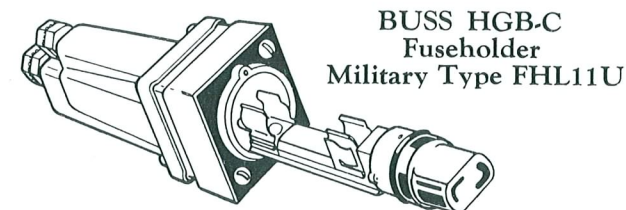
Terminals are plated brass with external tooth lock washers and hex nuts, 8-32 threads.

"O" ring and gasket makes holder drip proof from front of panel.

Test hole is provided in body so circuit can be tested without disturbing fuse carrier.

Holder designed for panels up to 1/8 inch thick.

Holder is inserted in panel from rear. Mounting screws can be conveniently tightened from front of panel.



Single Pole for 1/4 x 1 1/4 inch fuses

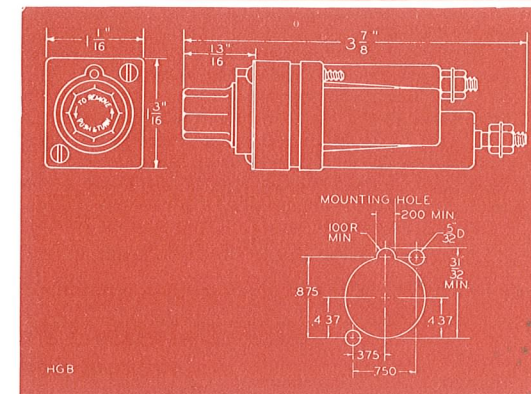
Made to Military Specification Type MIL-F-19207B

SN N 5920-581-7959. Drawing No. 9000-S6202-74229 Rev. D

For circuits of 90 to 250 volts — Maximum ampere rating 30 — Neon type lamp — Lamp resistor 120,000 ohms — Clear flat sided knob. Body of molded alkyd.

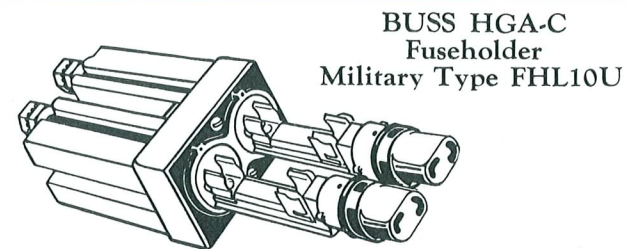
BUSS HGB. Same as HGB-C except clear octagon knob.

Carton quantity 10. Shipping Weight 20 1/2 lbs. per 100.



Dimensions of HGB-C and HGB

When tooling up for mounting holder, get latest blueprint.



Two Pole for 1/4 x 1 1/4 inch fuses

Made to Military Specification Type MIL-F-19207B

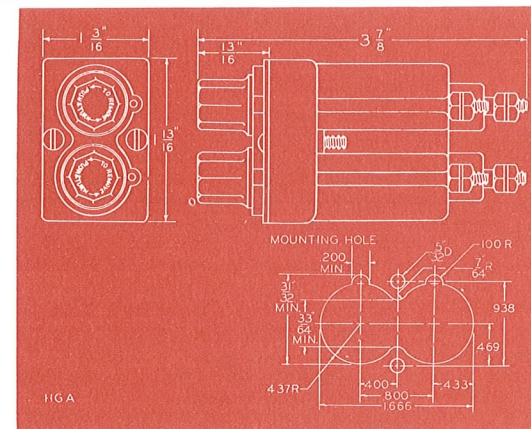
SN N 5920-296-5869. Drawing No. 9000-S6202-74228 Rev. D

For circuits of 90 to 250 volts — Maximum ampere rating 30 — Neon type lamp — Lamp resistor 120,000 ohms — Clear flat sided knob. Body of molded alkyd.

Carton quantity 10. Shipping Weight 38 1/2 lbs. per 100.

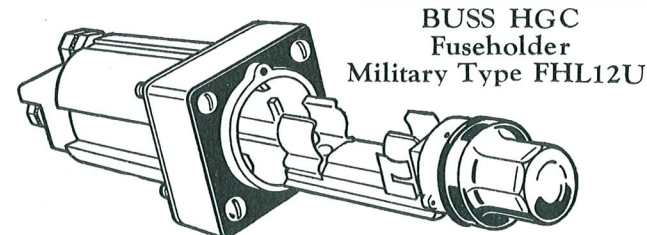
BUSS HGA. Same as HGA-C except clear octagon knob and molded black phenolic body.

Carton quantity 10. Shipping Weight 31 1/2 lbs. per 100.



Dimensions of HGA-C and HGA

When tooling up for mounting holder, get latest blueprint.



Single Pole for 1 3/32 x 1 1/2 inch fuses

Made to Military Specification Type MIL-F-19207B

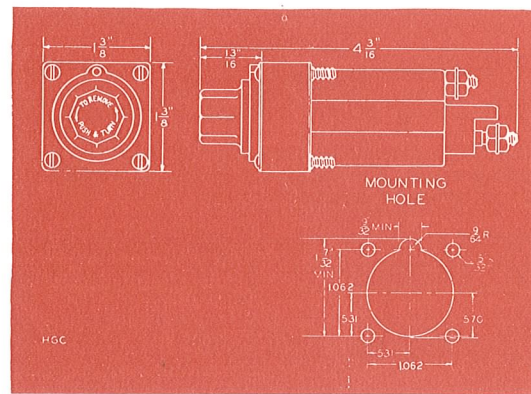
SN N 5920-552-0269. Drawing No. 9000-S6202-74230 Rev. D

For circuits of 90 to 500 volts — Maximum ampere rating 30 — Neon type lamp — Lamp resistor 330,000 ohms — Clear octagon knob. Body of molded alkyd.

HIGH INTERRUPTING CAPACITY

HGC Fuseholders, with BUSS KLM fuses, have been tested and found safe on circuits capable of delivering 68,000 amperes at 500 volts or less both AC or DC.

Carton quantity 10. Shipping Weight 30 lbs. per 100.



Dimensions of HGC

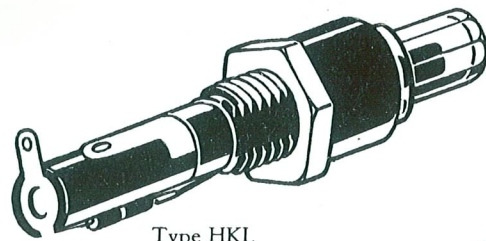
When tooling up for mounting holder, get latest blueprint.

HOLDER FOR SPARE FUSES — A spare holder for spare fuses dimensionally interchangeable with any of above holders can be obtained.

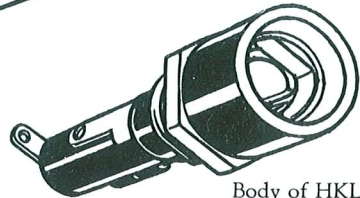
BUSS Panel Mounted FUSEHOLDERS

Lamp Indicating Series HK and HJ

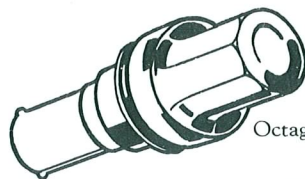
For 1/4 x 1 and 1/4 x 1 1/4 inch Fuses



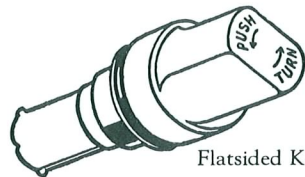
Type HKL



Body of HKL



Octagon Knob



Flatsided Knob

Bayonet type knob. Body of molded phenolic. Strong coil spring provides contact pressure at ends of fuse.

Transparent knob permits indicating light to be readily seen.

HKL, HKL-X and HJL side and end terminals—are and HKX, HKU, HKT and HKR side terminal—are held mechanically as well as by solder. Heat of soldering cannot cause terminals to loosen or come off. HKX, HKU, HKT and HKR end terminals are held mechanically but move outward approximately 1/8 inch when fuse is inserted.

Fuseholder is designed to withstand vibration as required in aircraft applications.

Holder is inserted through front of panel and can be used in panels up to 3/16 inches thick.

Furnished with holder is a flat neoprene washer and steel fastening nut that is zinc plated and chromate dipped.

A flat area on threaded section prevents rotation when holder is used in a punched hole—or permits use of a locking slug in a drilled hole. Holes shown on dimensional drawing.

1/16 inch locking slugs are obtainable on request, without extra charge.

If holders that are drip proof from front of panel are required, they can be furnished at slight additional cost. Flat washer on body is replaced with "O" ring and "O" ring is added to knob. To specify them add letter W to Type shown in table below. (Example HKL-W.)

When fuses rated at 1/2 ampere or less are used in fuseholders rated at 90 volts or less, special consideration should be given to the relationship between resistance value of the fuse and the parallel resistance value of the lamp and resistor.

Holders have Non-Interchangeable Fuse Carriers

Carriers of HKX, HKU, HKT and HKR holders with fuse will not fit in HKL, HKL-X or HJL holders and vice versa.

This assures indication by the lamp when the fuse is blown because the higher voltage lamp cannot be unintentionally installed in a low voltage circuit and vice versa.

The bodies of the HKX, HKU, HKT and HKR are also brown in color to distinguish them from the HKL, HKL-X and HJL which have black bodies.

For Military Use

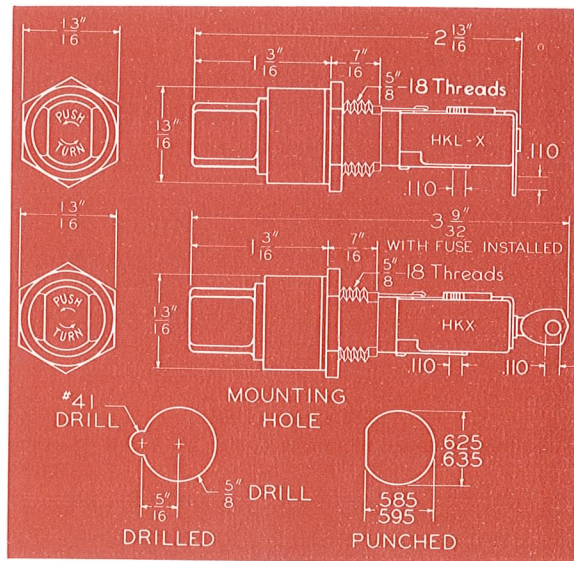
The HK series fuseholders are also available in military type. These fuseholders meet all the requirements of Military Specification MIL-F-19207B—and cover the entire voltage range from 12 to 250 volts.

The body molding material is Navy Grey diallyl phthalate SDG(F) of MIL-M-14. The Type Designation is stamped on the body. The assembly is equipped with an internal tooth lockwasher and solder dipped terminals. The fuseholder is fungus resistant and drip proof, and meets a 200 hour salt spray test.

To provide a more positive finger grip, fuseholders are supplied with a knob that has two flat parallel sides to make it easier to change the fuse with a gloved hand.

Military Type Designation	For Dimensions See Type	†Voltage	Lamp Resistor Ohms	Knob Color
FHL17G1	HKL-X*	90-250	120,000	Clear
FHL18G1-1	HKX*	12-22	None	Amber
FHL18G1-2	HKX*	23-33	330	Amber
FHL18G1-3	HKX*	34-45	680	Amber
FHL18G1-4	HKX*	46-60	1,200	Amber
FHL18G1-5	HKX*	61-80	1,800	Amber
FHL18G1-6	HKX*	81-90	2,000	Amber
FHL18G1-7	HKX*	2.5-4	None	Amber
FHL18G1-8	HKX*	5-7	22	Amber
FHL18G1-9	HKX*	8-12	39	Amber

* DO NOT ORDER BY THIS SYMBOL—USE MILITARY TYPE DESIGNATION.



Dimensions of HKL and HJL same as HKL-X
Dimensions of HKR, HKT and HKU same as HKX

When tooling up for mounting holder, get latest blueprint.

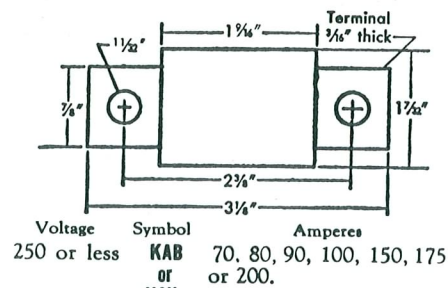
Type	Fuse Size Inches	Lamp †Voltage	Maximum Current Carrying Capacity	Type Lamp	Lamp Resistor Ohms	Type Knob	Knob Color	Body Color	Wt. Lbs. per 100	Carton Quantity
HJL	1/4 x 1	90 to 250	20	Neon	220,000	Octagon	Clear	Black	5 1/8	10
*HKL	1/4 x 1 1/4	90 to 250	20	Neon	220,000	Octagon	Clear	Black	5 1/8	10
HKL-X	1/4 x 1 1/4	90 to 250	20	Neon	220,000	Flat Sided	Clear	Black	5 1/8	10
HKR	1/4 x 1 1/4	22 to 33	20	Incandescent	330	Octagon	Amber	Black	5 1/8	10
HKT	1/4 x 1 1/4	13 to 22	20	Incandescent	None	Octagon	Amber	Black	5 1/8	10
HKU	1/4 x 1 1/4	4 to 6	20	Incandescent	15	Octagon	Red	Black	5 1/8	10
HKX	1/4 x 1 1/4	22 to 33	20	Incandescent	330	Flat Sided	Amber	Black	5 1/8	10

* HKL Holder listed by Underwriters' Laboratories, Inc. for 15 ampere 250 volt rating.

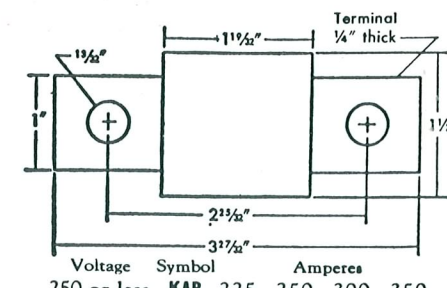
† Voltage shows operating range for lamp indication.

HOLDERS FOR SPARE FUSES—A spare holder for spare fuses dimensionally interchangeable with any of above holders can be obtained.

For 250 volts or less

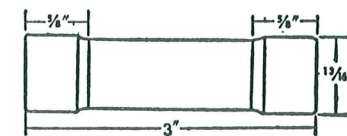


Carton quantity 10.
Shipping weight 41 1/4 lbs. per 100.

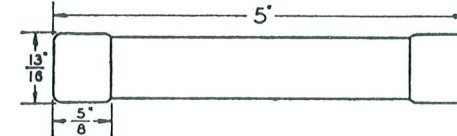


Carton quantity 10.
Shipping weight 60 3/4 lbs. per 100.

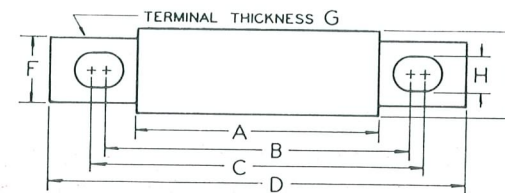
For 600 volts or less



Carton quantity 10.
Shipping weight 12 lbs. per



Carton quantity 10.
Shipping weight 13 lbs. per 100.



600 or less **KAC** 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 15, 17 1/2, 20, 25, 30, 35, 40, 45, 50, 60.
600 or less **KBC** 35, 40, 45, 50, 60.
600 or less **KAC or KBC** 70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250, 300, 350, 400, 425, 450, 500, 600, 800.

Symbol	Ampere Rating	Dimensions are in inches							H Mounting Holes		Carton Quantity	Lbs. per 100
		A	B	C	D	E	F	G	Round	Elongated		
KAC	0-30	1 7/8		2 1/2	2 7/8	9/16	1 3/32	1 1/6	1/4	1 1/32	10	4 3/4
	35-60	2 3/4		3 5/8	4 3/8	1 1/16	5/8	3/4	1/4	1 1/32	10	13 3/4
	65-100	2 29/32	3 21/32	4 11/16	5	1	3/4	1 1/8	1/4	1 1/32	1	37 1/2
	110-200	2 29/32	3 21/32	4 3/8	5 1/2	1 1/2	1 1/8	3/4	1/4	1 1/32	1	84 1/2
	225-400	3		4 3/4	6 1/4	2	1 5/8	1 1/4	1/4	1 1/32	1	187 1/2
KBC	425-600	3 1/16		4 3/4	6 1/4	2 1/2	2	1 1/2	1/4	1 1/32	1	331 1/2
	35-60	2 3/4		3 5/8	4 3/8	1 1/16	5/8	3/4	1/4	1 1/32	10	13 3/4
	65-100	2 29/32		3 21/32	4 13/32	1	3/4	1 1/8	1/4	1 1/32	1	43
	110-200	2 29/32		3 21/32	4 13/32	1 1/2	1 1/8	3/4	1/4	1 1/32	1	95
	225-400	2 29/32		4 1/16	5 1/8	1 1/2	1	1 1/4	1/4	1 1/32	1	106
	425-600	2 7/8		4 1/16	5 1/8	2	1 1/2	1 1/4	1/4	1 1/32	1	128

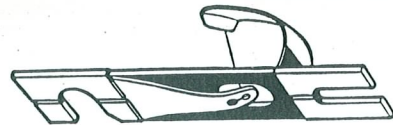
BUSS FUSE BLOCKS FOR RECTIFIER PROTECTION FUSES

Type	Fuse Symbol & amperes	Block No.	Dimensions of base — inches
1 pole	KAA 1 to 30	4515	3/4 x 2 9/16
2 pole	KAW	4525	1 5/16 x 2 9/16
3 pole		4535	2 1/16 x 2 9/16
1 pole	KAH 35 to 60	3520	1 3/8 x 3 7/8
2 pole		3544	2 3/4 x 3 7/8
3 pole		3545	4 1/8 x 3 7/8
1 pole	KAA 70 to 400	3575	1 1/4 x 3 1/16
3 pole		3560	3 3/4 x 3 1/16
1 pole	KAA 450 to 1000	3576	1 3/4 x 3 1/2
3 pole		3557	5 1/4 x 3 1/2
1 pole	KAB & KAX 1 to 30	4386	3/4 x 3 1/4
2 pole		4287	2 x 3 1/2
3 pole		3959	3 x 3 1/2
1 pole	KAB & KAX 35 to 60	3531	1 1/2 x 3 3/16
3 pole		3604	4 1/2 x 3 3/16
1 pole	KAB & KAX 70 to 200	3556	1 1/2 x 3 1/8
3 pole		3521	5 23/32 x 3 1/8
1 pole	KAB & KAX 225 to 800	3562	1 3/4 x 3 27/32
3 pole		3515	5 1/4 x 3 27/32

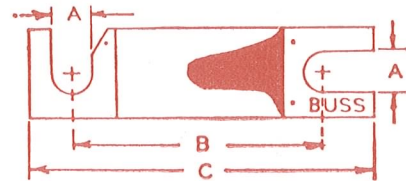
Type	Fuse Symbol & amperes	Block No.	Dimensions of base — inches
1 pole	KAC 1 to 30	3595	1 1/4 x 3 1/2
2 pole		3528	2 1/2 x 3 1/2
3 pole		2795	3 1/2 x 3 1/2
1 pole	KAC & KBC 35 to 60	3571	1 1/2 x 5
3 pole		3513	3 3/4 x 5
1 pole	KAC 70 to 100	3594	1 3/4 x 5
2 pole		2834	2 3/4 x 5
3 pole		3523	4 x 5
1 pole	KAC 110 to 200	3591	2 1/4 x 6 1/8
3 pole		3512	6 x 6 1/8
1 pole	KAC 225 to 400	3572	3 1/4 x 6 7/8
3 pole		3503	9 x 6 7/8
1 pole	KAC 425 to 800	3580	3 1/4 x 6 7/8
3 pole		3510	9 x 6 7/8
1 pole	KAJ 35 to 60	3519	1 3/8 x 4 7/8
2 pole		2833	2 3/4 x 4 7/8
3 pole		2860	4 1/8 x 4 7/8
1 pole	KBC 70 to 100	2713	1 3/4 x 5
3 pole		2760	5 1/2 x 5
1 pole	KBC 110 to 200	2650	1 3/4 x 5
3 pole		2714	2 1/4 x 6 1/8

GBB — Use any BUSS block for 1/4 x 1 1/4 inch fuse.

BUSS GRASSHOPPER FUSES



A color code is used on the insulating bar to indicate type and amperage of fuse. This helps in assuring proper replacement.



Give a visible signal and activate an alarm circuit when blown.

For quick identification of circuit in trouble, when fuse blows — indicator spring rises well above insulator bar — and sharp spur on alarm spring makes positive contact on alarm bus.

Symbol	Amps	Maximum Blowing Time Amperes	Seconds	Volts	Color Code	"A"	"B"	"C"	Mount. Screw
35A	1 1/3	2	90	90 or less	White	.200	1 3/16	1 4 3/64	10
35B	1 1/3	2	90	90 or less	White	.150	1 3/16	1 4 3/64	6
35B	2	3	180	90 or less	Orange	.150	1 3/16	1 4 3/64	6
35C	2	3	180	90 or less	Orange	.200	1 3/16	1 4 3/64	10
35D	1 1/3	2	90	90 or less	White	.150	1 1/8	1 5/8	6
35E	3	4	300	90 or less	White	.150	1 1/2	1 6 3/64	6
35F	1 1/2	3 1/4	90	90 or less	Red	.200	1 3/16	1 4 3/64	10
35G	3	4 1/2	300	90 or less	Blue	.150	1 3/16	1 4 3/64	6
35H	5	6 1/2	300	90 or less	Green	.150	1 3/16	1 4 3/64	6
35J	1 1/2	3 1/4	90	160 or less	Red	.200	1 3/16	1 4 3/64	10
35K	1 1/3	2	180	160 or less	White	.200	1 3/16	1 4 3/64	10
35L	2	3	180	160 or less	Orange	.200	1 3/16	1 4 3/64	10
35M	3	4 1/2	300	160 or less	Blue	.150	1 3/16	1 4 3/64	6
35N	5	6 1/2	300	160 or less	Green	.150	1 3/16	1 4 3/64	6
35P	3 1/4	1 1/8	90	160 or less	Tan	.200	1 3/16	1 4 3/64	10
35R	1 1/10	.270	90	90 or less	Yellow	.200	1 3/16	1 4 3/64	10
35S	1 1/4	.375	90	160 or less	Pink	.200	1 3/16	1 4 3/64	10
35T	6 5/100	1.1	180	90 or less	Tan	.200	1 3/16	1 4 3/64	10

Carton Quantity 10

BUSS Type SC Fuses

BUSS Type SC fuses are size-limiting and may be applied in any circuit rated 300 volts or less. These fuses contain time-delay features which allow harmless transient currents to pass without blowing the fuse. They have an interrupting rating of 100,000 amperes with a high degree of current-limitation to prevent damage to circuits, appliances or equipment on heavy short-circuits.

The physical dimensions have been reduced to the smallest practical size so that panels and fuse blocks, which are designed to house them, will be space saving.

BUSS Type SC fuses are 1 3/32" in diameter with lengths that vary according to the amperage range.

Type SC fuses fit size-limiting fuse blocks which are available in 1, 2 and 3 pole styles.

For detailed information ask for bulletin SCS. Listed by Underwriters' Laboratories, Inc.

Volts	Symbol	Amperes	Length Over All
300 or less	SC	1, 3, 6, 10, 15	1 5/16
"	SC	20	1 11/32
"	SC	25, 30	1 5/8
"	SC	35, 40, 45, 50, 60	2 1/4

BUSS KAZ Actuator



BUSS KAZ Actuators are used primarily to call attention to the opening of a larger fuse (50 amperes or larger). These fuses can provide visual indication or when used in a special micro-switch fuse block (BUSS No. 2837 or No. 2838), can provide a signal activating scheme to announce trouble at a distant station.

The indicating mechanism in the KAZ Actuator is a spring operated pin which is released by the opening of an internal element. Applied in parallel with larger fuses, the KAZ Actuator finds useful application in fused breaker units, semi-conductor power rectifier circuits, power factor correction capacitors, and other circuits where fuses larger than 50 amperes are used.

Although these fuses may be mounted "piggy-back" on larger fuses, 2 and 3 pole KAZ Actuator Blocks are available for remote signaling.

200,000 ampere interrupting rating, 600 volts or less, 1 3/32" x 2". Opens at 10 amperes or more.

For detailed information ask for bulletin KAFS.

BUSS HIGH VOLTAGE FUSES



HVA, HVB, HVR and HVT HVJ, HVL, HVU and HVX
HVA, HVB, HVJ, and HVL fuses are designed for protection of circuits up to 20 KW on d.c. and 30 KVA on a.c.

Test specifications—carry 110%, open at 135% within 1 hour.

Voltage	Symbol	Amperes	Diameter of caps	Length inches	Pounds per 100
1000 or less	HVA	3/8, 1/2, 3/4, 1, 1 1/2 or 2	1 3/32	3	2
2500 or less	HVB	1/2, 3/4, 1, 1 1/2 or 2	1 3/32	4 1/2	3
5000 or less	HVJ	1/2, 3/4, 1, 1 1/2 or 2	1 3/16	5	9
10000 or less	HVL	1/2, 3/4, 1, 1 1/2 or 2	1 3/16	10	15

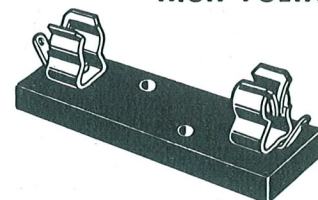
For higher interrupting capacity, use

HVR fuses for circuits up to 500 KVA a.c. only
HVT fuses for circuits up to 1250 KVA a.c. only
HVU fuses for circuits up to 2500 KVA a.c. only
HVX fuses for circuits up to 5000 KVA a.c. only
HVW fuses for circuits up to 12000 KVA a.c. only

Test specifications—carry 100%, open at 150% within 1 hour.

Voltage	Symbol	Amperes	Diameter of caps	Length inches	Pounds per 100
1000 or less	HVR	1/2, 1, 1 1/2, 2, 3, 4, 5	1 3/32	3	3
2500 or less	HVT	1/2, 1, 1 1/2, 2, 3, 4, 5	1 3/32	4 1/2	4
5000 or less	HVU	1/2, 1, 1 1/2, 2, 3, 4, 5	1 3/16	5	19
10000 or less	HVX	1/2, 1, 1 1/2, 2, 3, 4, 5	1 3/16	10	36
1200 or less	HVW	1/2, 1, 2, 3, 4, 5, 6	1 3/32	2 1/2	2

FUSE BLOCKS FOR BUSS HIGH VOLTAGE FUSES

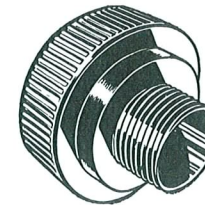


Bakelite base — alloy plated solder terminals.
Two mounting holes for No. 8 screws on No. 4528 and 4529 and for No. 10 screws on No. 4530 and No. 2960.

For HVA & HVR fuses	Number	Length inches	Width inches	Thickness inches
" HVB & HVT "	4528	3 3/4	1	3/8
" HVJ & HVU "	4529	5 1/4	1	3/8
" HVL & HVX "	4530	6 1/2	1 3/8	1/2
" "	2960	11 1/16	1 3/8	3/4

BUSS Panel Mounted FUSEHOLDERS Series HPC

For 1 3/32 x 1 3/8 and 1 3/32 x 1 1/2 inch FUSES



Screw type knob.
Strong coil spring provides contact pressure on ends of fuse.
Side terminal is held mechanically as well as by solder. Heat of soldering cannot cause it to loosen or come off.

Vibration will not cause failure of terminals as they are designed to withstand severe service.

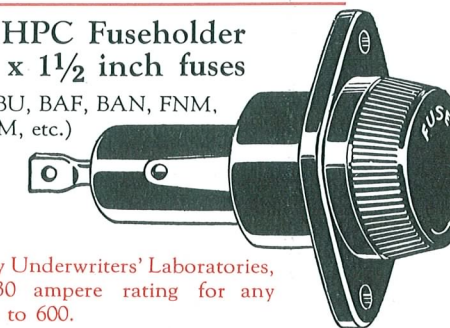
Holder is attached to panel with screws or rivets. It can be mounted with flange on front side of panel of any thickness. With flange on rear side, panel of thickness up to 1/8 inch can be used.

HPC-L Fuseholder for 1 3/32 x 1 3/8 inch BUSS (BBS) fuses

Listed by Underwriters' Laboratories, Inc. for 5 ampere rating and any voltage up to 600 volts.
Carton quantity 10. Shipping Weight 6 3/4 lbs. per 100.

BUSS HPC Fuseholder for 1 3/32 x 1 1/2 inch fuses

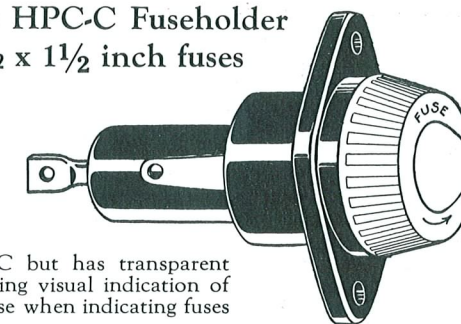
(AGU, ABU, BAF, BAN, FNM, MDR, KLM, etc.)



Listed by Underwriters' Laboratories, Inc. for 30 ampere rating for any voltage up to 600.

Quick-connect terminals also available — specify HPC-K.
Carton quantity 10. Shipping Weight 6 3/4 lbs. per 100.

BUSS HPC-C Fuseholder for 1 3/32 x 1 1/2 inch fuses

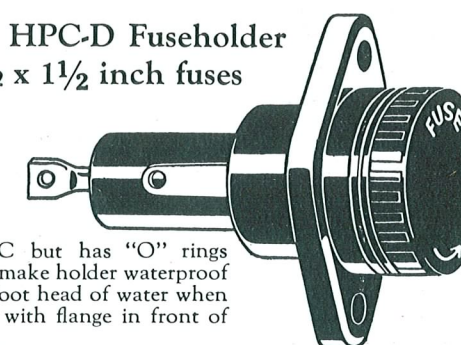


Like HPC but has transparent knob giving visual indication of blown fuse when indicating fuses are used.

Takes MIN, MIC, FNA.

Listed by Underwriters' Laboratories, Inc. for 15 ampere rating for any voltage up to 250.
Quick-connect terminals also available — specify HPC-CK.
Carton quantity 10. Shipping Weight 6 3/4 lbs. per 100.

BUSS HPC-D Fuseholder for 1 3/32 x 1 1/2 inch fuses



Like HPC but has "O" rings added to make holder waterproof under 6 foot head of water when mounted with flange in front of panel.

Normal current carrying capacity 30 amperes for any voltage up to 600.

Carton quantity 10.

Shipping Weight 7 1/2 lbs. per 100.

HOLDER FOR SPARE FUSES — A spare holder for spare fuses dimensionally interchangeable with any of above holders can be obtained. Words "Spare Fuse" shown on cap.

Body is of molded black phenolic.
Normal current carrying capacity 30 amperes.

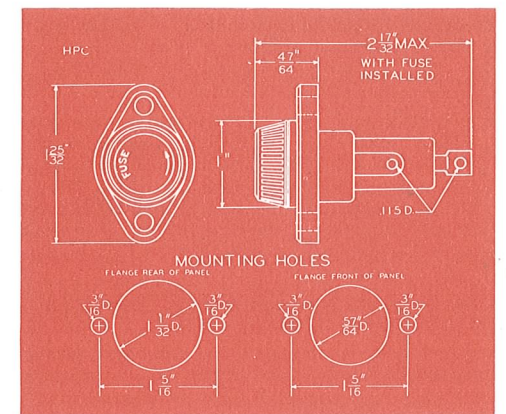
For Military Use

Series HPC fuseholders are also available in military type. They meet all the requirements of Military Specification MIL-F-19207B.

Military Type Designation
FHL22W
FHN23W

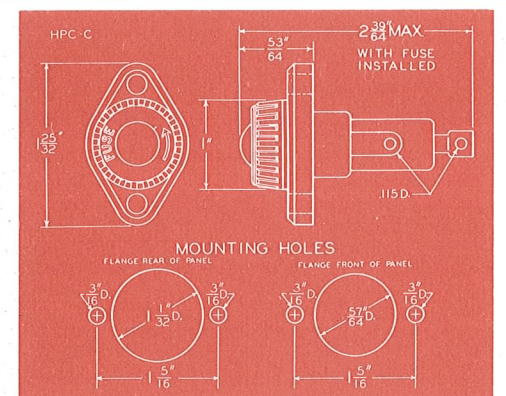
For Dimension See Type
HPC-C*
HPC-D*

* DO NOT ORDER BY THIS SYMBOL — USE MILITARY TYPE DESIGNATION.



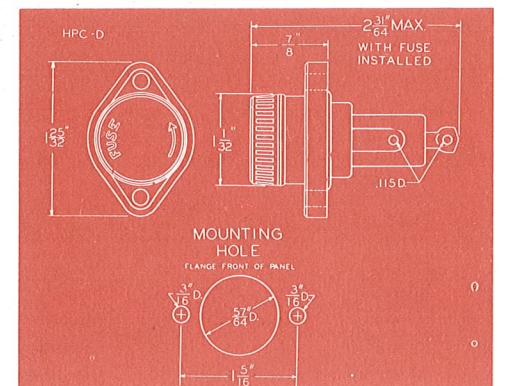
HPC and HPC-L HOLDERS

When tooling up for mounting holder, get latest blueprint.



HPC-C HOLDER

When tooling up for mounting holder, get latest blueprint.



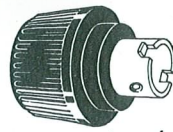
HPC-D HOLDER

When tooling up for mounting holder, get latest blueprint.

BUSS Panel Mounted FUSEHOLDERS

Non-Indicating Series HJ, HK and HCM

For $\frac{1}{4} \times 1$, $\frac{1}{4} \times 1\frac{1}{4}$ and $\frac{3}{32} \times 1\frac{1}{4}$ inch FUSES



Bayonet type knob.

Strong coil spring provides contact pressure on ends of fuse.

Side terminal is held mechanically as well as by solder. Heat of soldering cannot cause it to loosen or come off.

Vibration will not cause failure of terminals as they are designed to withstand severe service.

Holder is inserted through hole in panel and can be used in panels up to $\frac{5}{16}$ inch thick.

Neoprene washer and zinc plated, chromate dipped steel fastening nut are furnished with each holder.

Body is of molded black phenolic.

Flat spot of body locks it against rotation when used in punched hole — or permits use of a locking key in drilled holes.

Locking keys are obtainable, without charge, — $\frac{1}{16}$ inch long for panels up to $\frac{1}{8}$ inch thick or $\frac{1}{8}$ inch long for thicker panels. Specify length wanted.

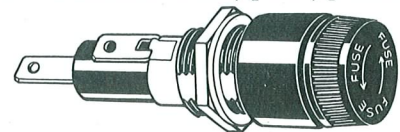
For Military Use

Series HJ, HK, and HCM fuseholders are also available in military type. They meet all the requirements of Military Specification MIL-F-19207B.

Military Type Designation	For Dimension See Type
FHN19G	HCM*
FHN26G1	HKP*
FHN31G1	HJM*

* DO NOT ORDER BY THIS SYMBOL — USE MILITARY TYPE DESIGNATION.

HKP Fuseholder for $\frac{1}{4} \times 1\frac{1}{4}$ inch fuses



Illustrated with quick-connect terminals—specify HKP-HH.

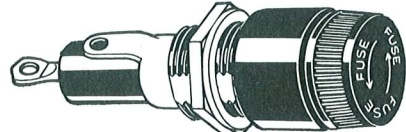
Normal current carrying capacity 30 amperes.

Knob grips fuse tightly and pulls it from holder when knob is removed.

Listed by Underwriters' Laboratories, Inc. for 15 ampere rating for any voltage up to 250.

Carton quantity 10. Shipping Weight $3\frac{1}{4}$ lbs. per 100.

To order with standard terminals—specify HKP.



HJM Fuseholder for $\frac{1}{4} \times 1$ inch fuses

Normal current carrying capacity 30 amperes.

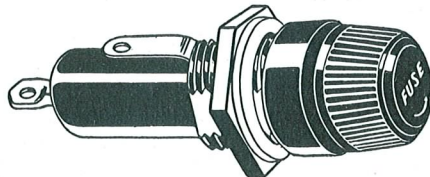
Knob grips fuse tightly and pulls it from holder when knob is removed.

Listed by Underwriters' Laboratories, Inc. for 5 ampere rating for any voltage up to 125.

Shipping Weight $3\frac{1}{4}$ lbs. per 100.

Quick-connect terminals also available — specify HJM-HH.

HJM-CC & HKP-CC — These holders project a shorter distance behind panel than do the regular HJM or HKP. Dimensions as shown for HJM or HKP except $\frac{3}{4}$ inch dimension is $\frac{7}{8}$ inch and $\frac{15}{32}$ inch dimension is $\frac{5}{8}$ inch.



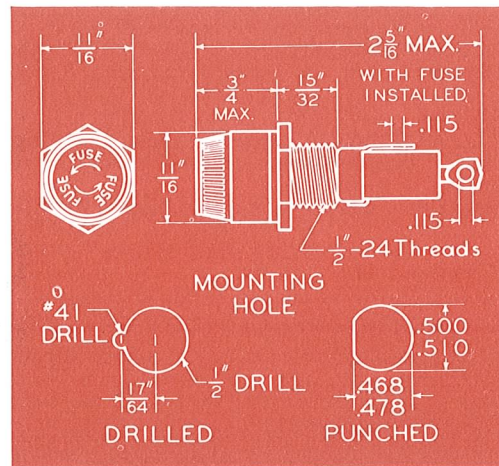
HCM Fuseholder for $\frac{3}{32} \times 1\frac{1}{4}$ inch fuses

Normal current carrying capacity 18 amperes for any voltages up to 250.

Knob grips fuse tightly and pulls it from holder when knob is removed. Fuseholder for $\frac{1}{4} \times 1\frac{1}{4}$ inch fuse also available specify HCM-D.

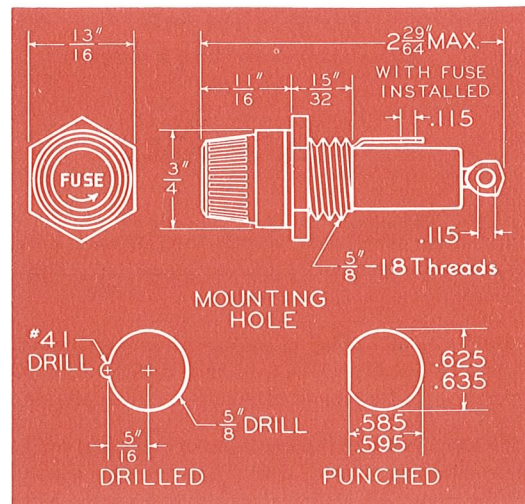
Carton quantity 10. Shipping Weight $4\frac{1}{4}$ lbs. per 100.

TEST PROD HOLE — These fuseholders with test prod hole in knob can be obtained by giving catalog symbol followed by -H (Example HKP-H).



HJM and HKP HOLDERS

When tooling up for mounting holder, get latest blueprint.



HCM and HCM-D HOLDERS

When tooling up for mounting holder, get latest blueprint.

BUSS AIRCRAFT FUSES

Mechanical Indicating — Limiter type

ACH limiters are designed to meet the very rigorous requirements of high speed, high performance aircraft. They isolate faults or grounds in aircraft electric systems of 120/208 volts 400 cycles AC or 125 volts DC.

ACH limiters give visual indication when blown by a spring activated pin that extends from the limiter body.

These limiters are designed basically for short-circuit protection. Because of their small physical size they may run quite hot on sustained loads near their carrying capacity. Normally this is not objectionable in applications for which they are intended.

The knife blade terminals on ACH limiters are silver plated. Limiters are made with a silicone body that assures reliable performance under severe conditions. They are designed to withstand exposure to moisture, fungus, salt spray, sand and dust, and mechanical vibration and shock. To assure dependable operation they are given various electrical tests at ambient temperatures ranging from -54°C to $+125^{\circ}\text{C}$.

Test specification — carry 200% rated current for 5 minutes, open at 240% within 5 minutes.

Interrupting rating — 6000 amperes at 120 volts AC, 4200 amperes at 208 volts AC, 6000 amperes at 125 volts DC — at sea level to 60,000 feet.

For time-current characteristics see charts on page 23.

Symbol	Amperes	Overall length	Thickness	Contact Blade Width	Length
ACH	1, 2, 3, 5, 10, 15, 20, 25 or 30	$1\frac{13}{32}$ "	$\frac{1}{16}$ "	$1\frac{13}{32}$ "	$2\frac{1}{4}$ "
ACH	35, 40, 50 or 60	$2\frac{7}{32}$ "	$\frac{3}{32}$ "	$1\frac{13}{32}$ "	$2\frac{5}{16}$ "

For Military Use Qualified to MIL-F-5372C

Military Type Designation	Buss Cat. Symbol
MS28938-01	ACH 1*
MS28938-02	ACH 2*
MS28938-03	ACH 3*
MS28937-05	ACH 5*
MS28937-10	ACH 10*
MS28938-15	ACH 15*
MS28937-20	ACH 20*
MS28938-25	ACH 25*
MS28937-30	ACH 30*
MS28938-35	ACH 35*
MS28937-40	ACH 40*
MS28937-50	ACH 50*
MS28937-60	ACH 60*

* DO NOT ORDER BY THIS SYMBOL — USE MILITARY TYPE DESIGNATION.

ACF, ACT and ACO Limiters

ACF, ACT and ACO limiters have same dimensions as shown for ACH limiters in same size ranges. They are available in ampere ratings of 1, 2, 3, 5, 10, 15, 20, 25, 30, 40, 50 or 60.

ACF limiters are made with an alkyd body, suitable for ambient temperatures from -55°C to $+85^{\circ}\text{C}$. Interrupting rating — 4000 amperes at 120 volts AC, 2500 amperes at 208 volts AC.

ACT and ACO limiters have phenolic composition bodies.

For time-current characteristics see charts on page 23.

FUSE BLOCKS FOR ABOVE FUSES

All metal parts silver plated. Clips are beryllium copper. Series 4184 through 4226 have

molded phenolic

base. Series 3887

through 3968 have molded

melamine base and are qualified to

MIL-F-5373C.

For ACH, ACF, ACT and ACO

1 to 30 amp.

For ACH, ACF, ACT and ACO

40 to 60 amp.

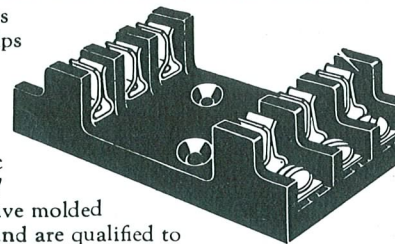
Number

Dimension of base, inches

1 pole 4190 or 3887 $\frac{5}{8} \times 3\frac{1}{8}$

2 pole 4184 or 3888 $1\frac{1}{8} \times 3\frac{1}{8}$

3 pole 4224 or 3967 $1\frac{5}{8} \times 3\frac{1}{8}$



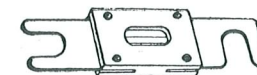
Number

Dimension of base, inches

1 pole 4185 or 3889 $1\frac{1}{8} \times 3\frac{1}{8}$

2 pole 4186 or 3890 $1\frac{1}{8} \times 3\frac{1}{8}$

3 pole 4226 or 3968 $2\frac{1}{4} \times 3\frac{1}{8}$



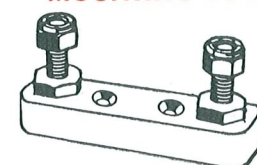
BUSS LIMITERS

These fuses are designed to isolate faults or grounds in aircraft distribution systems. They have a silver plated soft copper link which will maintain its time-current characteristics throughout the life of the fuse. The link is clearly visible through the mica window.

Symbol and amperes are stamped on the fuse terminal. Center to center dimensions $2\frac{1}{16}$ inches. Width of slot $\frac{1}{32}$ inch. See Blowing Time Charts, page 23.

Voltage	Symbol	Amperes
32 or less	ANL	35, 40, 50, 80, 100, 130, 150, 175, 200, 225, 250, 275, 325, 350, 400 or 500.

MOUNTING BLOCKS FOR ANL LIMITERS



Molded alkyd base with cadmium plated metal parts. Two countersunk mounting holes on 1 inch centers for No. 10 flat head screws.

Length $3\frac{1}{32}$ in. Width $1\frac{1}{16}$ in. Height $1\frac{1}{16}$ in. Studs center to center $2\frac{1}{16}$ inches.

No. 4164 furnished with stop nuts.
No. 4164-FR " " free running lock nuts.

BUSS FUSES, Stud mounted type



AFJ, AFS and AFX

Test specification — carry 110%, open at 135% in one hour.

Voltage	Symbol	Amperes	Center to center	Width of slot	Diameter	Pounds per 100	Carton Quantity
250 or less	AFJ	$\frac{1}{4}$, 1, $1\frac{1}{8}$, 2, 3, 5, 10 or 15	$2\frac{1}{2}$ "	$1\frac{7}{16}$ "	$\frac{9}{16}$ "	5	10
250 or less	AFJ	20, 25, 30 or 35	$2\frac{1}{2}$ "	$1\frac{7}{16}$ "	$\frac{9}{16}$ "	5	10
"	AFS	2, 5, 10, 20, 25, 35, 40, 50 or 60	3	$1\frac{7}{16}$ "	$1\frac{1}{16}$ "	10	10
"	AFX	40, 50, 60, 70, 75, 80, 100, 120, 125, 150 or 200	$3\frac{1}{2}$ "	$1\frac{7}{16}$ "	$1\frac{1}{16}$ "	17	10
32 or less	HBO	8, 10, 15, 20, 25, 30, 35, 40, 50, 60, 70, 75, 80, 100, 125 or 150	1	$1\frac{7}{16}$ "	$1\frac{1}{16}$ "	11	10

FUSETRON FUSES

Stud mounted type — Dual-Element



ACK and ACL

HSK

These fuses avoid needless blows from starting currents or surges. They have a fuse link which operates only on very high overloads or short-circuits — they have a thermal cut-out which functions on low overloads — the thermal cutout cannot operate quickly at any load, hence long time-lag is obtained on high overloads of short duration. Yet protection is afforded against short-circuits or continued overloads.

This long time-lag also makes it unnecessary to use extra large size or over-size fuses.

Approximate blowing time at various loads:

	ACK	ACL	HSK
200%	100 seconds	60 seconds	60 seconds
300%	35 "	20 "	20 "
500%	13 "	7 "	7 "

Test specification — carry 110%, open at 125% within two hours, at 200% in 40 to 480 seconds.

Voltage	Symbol	Amperes	Center to center	Width of slot	Outside Diameter	Pounds Per 100
125 or less	ACK	1, 2, 3, 5, 6, 10 or 15	$2\frac{1}{4}$ "	$1\frac{7}{16}$ "	$\frac{9}{16}$ "	6
125 or less	ACK	20, 25 or 30	$2\frac{1}{2}$ "	$1\frac{7}{16}$ "	$\frac{9}{16}$ "	6
"	ACL	30, 35, 40, 50 or 60	$2\frac{1}{2}$ "	$1\frac{7}{16}$ "	$\frac{9}{16}$ "	6
"	ACK	35, 40, 50 or 60	3	$1\frac{7}{16}$ "	$1\frac{1}{16}$ "	11
"	ACL	70, 100 or 120	$2\frac{3}{4}$ "	$1\frac{7}{16}$ "	$1\frac{1}{16}$ "	11
"	ACK	70, 75, 80, 90, 100 or 120	$3\frac{1}{2}$ "	$1\frac{7}{16}$ "	$1\frac{1}{16}$ "	20
"	ACK	140, 150, 160, 175 or 200	$3\frac{5}{8}$ "	$\frac{5}{16}$ "	$1\frac{1}{16}$ "	23
"	ACK	225, 250 or 300	$3\frac{7}{8}$ "	$\frac{5}{16}$ "	$1\frac{1}{16}$ "	25
32 or less	HSK	20, 30, 40, 50, 60, 70, 80, 100, 125 or 150	1	$1\frac{7}{16}$ "	$1\frac{1}{16}$ "	11

