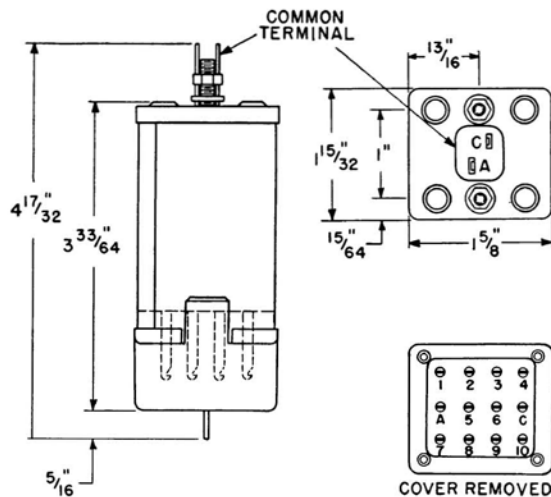


Capacitors

Western Electric



No. 187

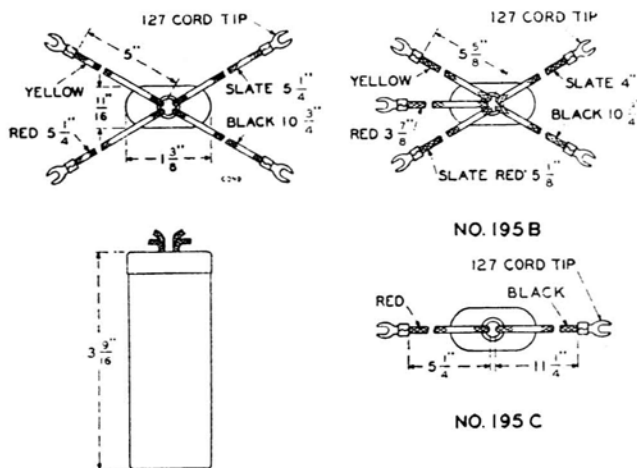
Consists of ten small paper units potted in metal can having metal cover. One side of each unit connected to common terminal; other side connected to one of ten terminals.

Mount on 1 3/4-in. horizontal, 1 1/2-in. vertical centers; furnished with two nuts and washers for mounting. Tested on 1,000 volts a-c. Suitable for use on continuously applied potentials not exceeding 300 volts d-c or a-c (60 cycles or less) and at operating temperatures not exceeding 120 degrees F.

| No. | Capacitance Obtainable |
|-------|-------------------------------------|
| *187A | 0 to .346 UF to within .00133 UF |
| 187B | 0 to .069 UF to within .00066 UF |
| †187C | 0 to .00584 UF to within .000084 UF |

*Together with No. 25A bracket replaces Nos. 57AK and 57E on equipments arranged for lug mounting.

†Together with No. 25B bracket replaces No. 134A on equipments arranged for lug mounting.



NO. 195A ALSO GENERAL DESIGN AND DIMENSIONS OF NO. 195 TYPE

No. 195B

No. 195C

A paper capacitor; potted in wax in lead cans; used in combined telephone sets.

| No. | Capacitance (U.F.) | Test Voltage (DC) Between Leads |
|-------|---------------------------|---|
| 195A | Max. *2.50 Min. **0.63 | 300 Red and Black 500 Yellow and Slate |
| †195B | Max. *2.50 Min. **0.63 | 300 Red and Black 500 Yellow and Slate |
| 195C | Max. *2.50 Min. 2.0 | 300 Red and Black |

*Suitable for use on continuously applied potentials not exceeding 130 volts d-c or 100 volts a-c (60 cycles or less) and at operating temperatures not exceeding 120 degrees F.

**Suitable for use on continuously applied potentials not exceeding 200 volts d-c or 180 volts a-c (60 cycles or less) and at operating temperatures not exceeding 120 degrees F.

†The can on the 195B capacitor is provided with an insulating coating and the slate red lead is connected to the can

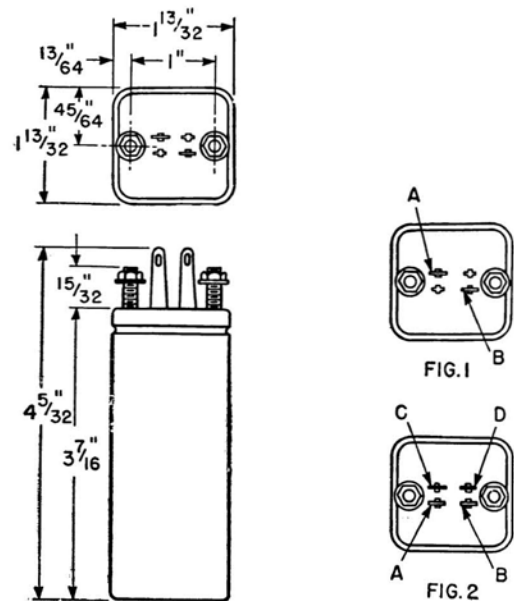
No. 198

Plastic film wax impregnated capacitors; black tape wrapping; tested on 600 volts d-c. Suitable for use on continuously applied potentials not exceeding 200 volts d-c or 180 volts a-c (60 cycles or less) and at operating temperatures not exceeding 150 degrees F.

| No. | Capacitance (U.F.) | Used In |
|------|----------------------|--------------------------|
| 198A | Max. .625 Min. .5 | No. 592AW Subscriber Set |
| 198B | Max. .625 Min. .5 | No. 531 Subscriber Set |

No. 361C

Plastic film wax impregnated capacitor; gray finish; tested on 600 volts d-c. Suitable for use on continuously applied potentials not exceeding 200 volts d-c or 180 volts a-c (60 cycles or less) at operating temperatures not exceeding 120 degrees F. Used on No. 1011 hand set.



No. 437 Type Capacitor

Capacitors

Western Electric

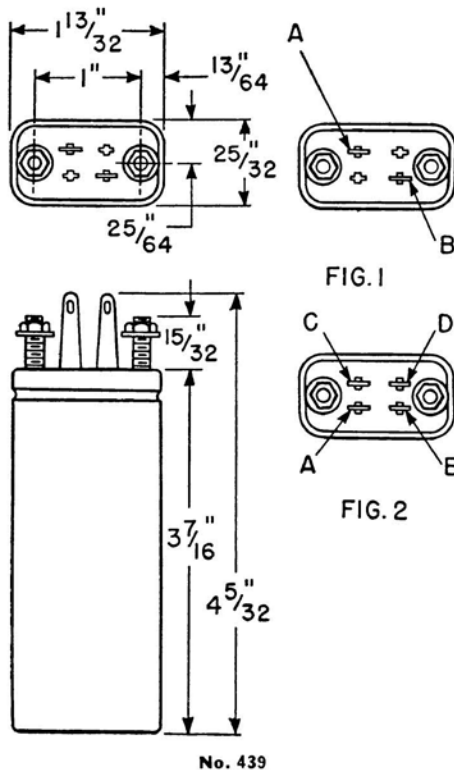
Paper capacitors; potted in wax in aluminum cans; tested on 500 volts DC. Suitable for use on continuously applied potentials not exceeding 200 volts DC or 180 volts AC (60 cycles or less) and at operating temperatures not exceeding 120 degrees F. Minimum capacitance values stamped on end of can; terminal letters stamped on end of cans of four terminal capacitors. No. 24 Brackets required when mounted in place of No. 57 or similar type capacitors. One mounting stud connected electrically to can.

No. 437 type Capacitors replace No. 137 type of corresponding letter.

| No. | Fig. No. | Capacitance (UF) Between Terminals | | | |
|---------------|----------|------------------------------------|------|------|------|
| | | Max. | Min. | Max. | Min. |
| 437A | 1 | 5.00 | 4.00 | | |
| *437B | 2 | 5.00 | 4.00 | 0.3 | .02 |
| *437C | 2 | 2.50 | 2.00 | 2.50 | 2.00 |
| *437D | 2 | 5.00 | 4.00 | .06 | .05 |
| †*437E | 2 | 2.50 | 2.00 | 2.50 | 2.00 |
| 437QA | 1 | 4.36 | 4.28 | | |
| *437QB | 2 | 4.36 | 4.28 | .03 | .02 |

*Consists of two separate capacitors insulated but not shielded from each other. These capacitors should not be used bridged off or across two separate transmission circuits; should not be used in the same circuit where effect of capacitance between the separate units will be detrimental to transmission.

†Same as No. 437C except the two units are matched so they do not differ by more than 0.11 U.F.



No. 439

Paper capacitors; potted in wax in aluminum cans; tested on 500 volts DC. Closest recommended mounting centers are 7/8-in. x 1 1/2-in. Suitable for use on continuously applied potentials not exceeding 200 volts DC or 180 volts AC (60 cycles or less) and at operating temperatures not exceeding 120 degrees F. Require No. 24 Brackets when mounted in place of No. 57 or similar type capacitors. One mounting stud connected electrically to can.

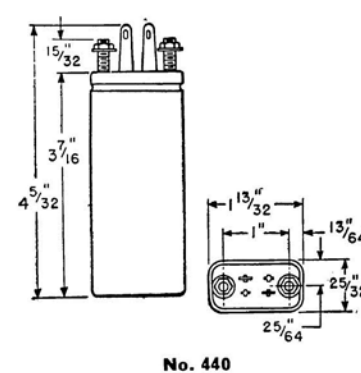
Minimum capacitance values, unless otherwise noted, are stamped on end of can.

No. 439 type Capacitors replace No. 139 type of corresponding letter.

| No. | Fig. No. | Capacitance (MF) Between Terminals | | | |
|---------------|----------|------------------------------------|------|------|------|
| | | Max. | Min. | Max. | Min. |
| 439A | 1 | 2.50 | 2.00 | | |
| *439B | 2 | 2.50 | 2.00 | .03 | .02 |
| *439C | 2 | 1.25 | 1.00 | 1.25 | 1.00 |
| *439D | 2 | 2.50 | 2.00 | .06 | .05 |
| *439E | 2 | 1.50 | 1.20 | 1.50 | 1.20 |
| †*439H | 2 | 1.25 | 1.00 | 1.25 | 1.00 |
| 439QA | 1 | 2.18 | 2.14 | | |
| 439QB | 1 | 2.16 | 2.10 | | |
| 439QC | 1 | 2.22 | 2.16 | | |
| 439QD | 1 | 2.24 | 2.08 | | |
| 439QE | 1 | 2.16 | 2.04 | | |
| 439QF | 1 | 2.28 | 2.16 | | |
| *439QG | 2 | 2.28 | 2.16 | .03 | .02 |
| *439QH | 2 | 1.08 | 1.05 | 1.25 | 1.00 |

*Consists of two separate capacitors insulated but not shielded from each other. These capacitors should not be used bridged off or across two separate transmission circuits; should not be used in the same circuit where effect of capacitance between the separate units will be detrimental to transmission.

†Same as No. 439C except the two units are matched so they do not differ by more than .055 U.F.



No. 440

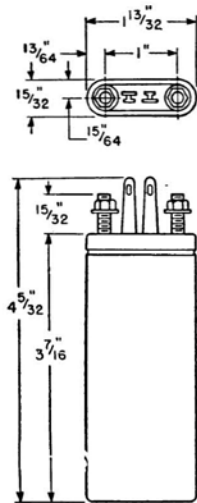
Paper capacitors; potted in wax in aluminum cans; tested on 1,400 volts DC between terminals. Closest recommended mounting centers are 7/8-in. x 1 1/2-in. Suitable for use on continuously applied potentials not exceeding 300 volts DC or 300 volts AC (60 cycles or less) and at operating temperatures not exceeding 120 degrees F.

Require No. 24 Brackets when mounted in place of No. 57 or similar type capacitors. One mounting stud connected electrically to can.

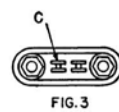
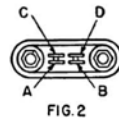
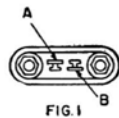
| No. | Capacitance (UF) | |
|--------------|------------------|------|
| | Max. | Min. |
| 440A | 1.25 | 1.00 |
| *440C | .62 | .50 |
| 440F | 1.57 | 1.25 |
| 440QA | 1.09 | 1.07 |
| 440QB | 1.12 | 1.04 |

*For use as plate blocking capacitor in repeater circuits where high insulation resistance required.

Capacitors Western Electric



No. 441



Paper capacitors; potted in wax in aluminum cans; tested on 500 volts DC. Minimum capacitance values stamped on end of can unless otherwise noted. Terminal letters stamped on end of cans of four terminal capacitors. Suitable for use on continuously applied potentials not exceeding 200 volts DC or 180 volts AC (60 cycles or less) and at operating temperatures not exceeding 120 degrees F. Closest recommended mounting centers are $\frac{1}{2}$ -in. x $1\frac{1}{2}$ -in. Require No. 24 Brackets when mounted in place of No. 57 or similar type capacitors. One mounting stud connected electrically to can.

capacitors. One mounting stud connected electrically to can.

| No. | Fig. No. | Capacitance (UF) Between Terminals | | | |
|-------|----------|------------------------------------|---------|------|------|
| | | Max. | Min. | Max. | Min. |
| 441A | 1 | 1.250 | 1.000 | | |
| 441B | 1 | .625 | .500 | | |
| *441C | 2 | .625 | .500 | .625 | .500 |
| 441D | 1 | .320 | .250 | | |
| *441E | 2 | .320 | .250 | .320 | .250 |
| *441F | 2 | .320 | .250 | .625 | .500 |
| *441G | 2 | .085 | ** .065 | .160 | .125 |
| *441H | 2 | .030 | .020 | .030 | .020 |
| 441J | 1 | .160 | .125 | | |
| 441K | 1 | .135 | .100 | | |
| 441L | 1 | .085 | ** .065 | | |
| 441M | 1 | .060 | † .404 | | |
| 441N | 1 | .030 | .020 | | |
| 441P | 1 | .006 | † .004 | | |
| *441R | 2 | .013 | .010 | .013 | .010 |
| 441S | 1 | 1.600 | 1.300 | | |
| *441T | 2 | .135 | .100 | .135 | .100 |
| 441U | 1 | .040 | .030 | | |
| 441QA | 1 | 1.090 | 1.070 | | |
| 441QB | 1 | 1.080 | 1.050 | | |
| 441QC | 1 | 1.110 | 1.080 | | |
| 441QD | 1 | 1.120 | 1.040 | | |
| 441QE | 1 | 1.080 | 1.020 | | |
| 441QF | 1 | 1.140 | 1.080 | | |
| 441QG | 1 | .545 | .535 | | |
| 441QH | 1 | .540 | .525 | | |
| 441QJ | 1 | .555 | .540 | | |
| 441QK | 1 | .560 | .520 | | |
| 441QL | 1 | .540 | .510 | | |
| 441QM | 1 | .570 | .540 | | |
| 441QN | 1 | .275 | .265 | | |
| 441QP | 1 | .280 | .260 | | |
| 441QR | 1 | .270 | .250 | | |
| 441QS | 1 | .290 | .270 | | |
| 441QT | 1 | .115 | .105 | | |
| 441QU | 1 | .110 | .100 | | |
| 441QW | 1 | .120 | .110 | | |

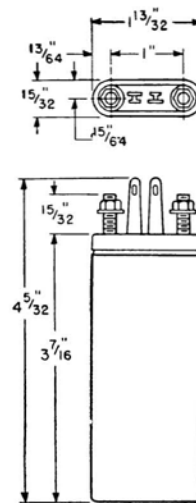
*Consists of two separate capacitors insulated but not shielded from each other. These capacitors should not be used bridged off or across two separate transmission circuits; should not be used in same circuit where effect of capacitance between separate units will be detrimental to transmission.

**Stamped .075 U.F. on end of can.

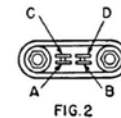
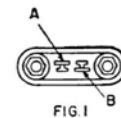
†Stamped .05 U.F. on end of can.

‡Stamped .005 U.F. on end of can.

Capacitors Western Electric



Type 442



Paper capacitors; potted in wax in aluminum cans; tested on 1,400 volts DC between terminals. Minimum capacitance values stamped on end of can. Suitable for use on continuously applied potentials not exceeding 300 volts DC or 300 volts AC (60 cycles or less) and at operating temperatures not exceeding 120 degrees F. Closest recommended mounting

centers are $\frac{1}{2}$ -in. x $1\frac{1}{2}$ -in. Require No. 24 type Brackets when mounted in place of No. 57 or similar capacitors. One mounting stud is connected electrically to the can.

| No. | Fig. No. | Capacitance (UF) Between Terminals | | | |
|-------|----------|------------------------------------|------|-------|------|
| | | Max. | Min. | Max. | Min. |
| 442A | 1 | .6200 | .500 | | |
| 442B | 1 | .3200 | .250 | | |
| 442C | 1 | .1250 | .100 | | |
| 442D | 1 | .0600 | .050 | | |
| *442E | 2 | .0300 | .020 | .0300 | .020 |
| *442F | 2 | .0065 | .005 | .0065 | .005 |

*Consists of two separate capacitors insulated but not shielded from each other. Should not be used bridged off or across two separate transmission circuits; should not be used in same circuit where effect of capacitance between separate units will be detrimental to transmission.

Fuses

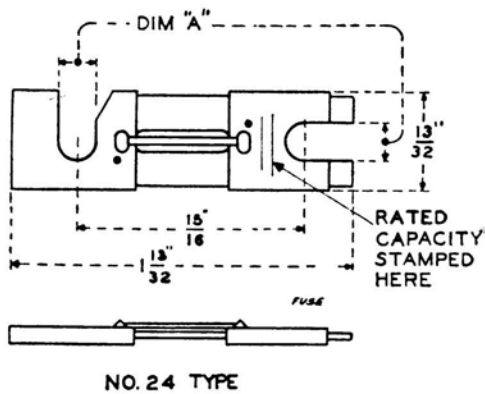
Western Electric

No. 24 Type

Non-Alarm Type Fuses

These fuses will mount on 1-in. centers by means of fuse posts or individual porcelain mounting as in the No. 62D Protector. The over-all dimensions are: length $1\frac{13}{32}$ in., width $\frac{13}{32}$ in. The current carrying capacities and operating current values are given in the table below.

In ordering it is necessary that both the code number and rated capacity be given.



| Fuse Code No. | Rated Capacities (Amperes) | Operates in Less Than One Minute On (Amperes) | Finish | Terminals Size of Screw Slotted For | Dim. "A" (Inch) |
|---------------|----------------------------|---|--------|-------------------------------------|-----------------|
| 24C | 2 | 3 | Tinned | No. 10 | $\frac{13}{64}$ |
| 24D | $\frac{3}{4}$ | $1\frac{1}{4}$ | Copper | No. 6 | $\frac{5}{32}$ |
| 24E | $\frac{1}{2}$ | 1 | Tinned | No. 10 | $\frac{13}{64}$ |
| 24F | 5 | $6\frac{1}{2}$ | Copper | No. 6 | $\frac{5}{32}$ |
| 24G | $1\frac{1}{3}$ | 2 | Tinned | No. 10 | $\frac{13}{64}$ |

Fuses

Western Electric

No. 35 Type—Indicator Alarm Type Fuses

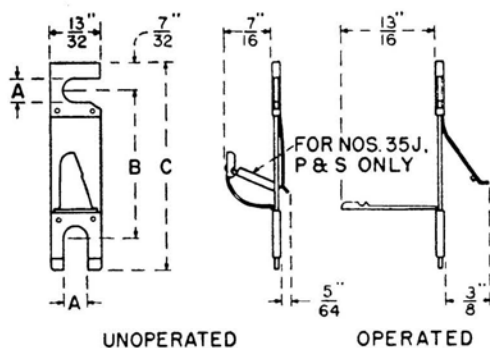


FIG. 1

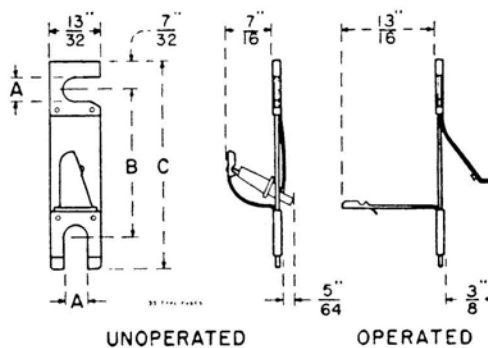


FIG. 2

Fuse wire mounted so one end fastened to flat indicator spring, other to flat spring. Terminal ends have copper tinned finish.

Mounting of fuse may be so arranged as to cause flat spring to make contact with alarm circuit when fuse wire broken.

When ordering specify code number and rated capacity.

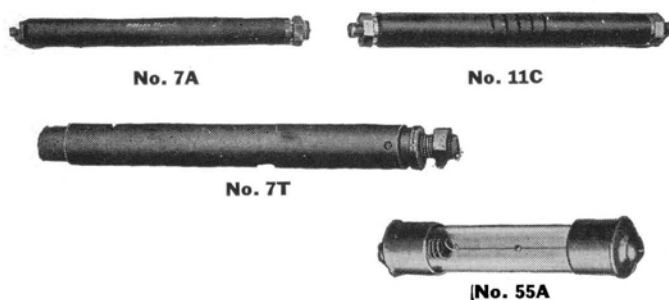
| Code No. | Rated Capacities (Ampere) | Amps. | Operates On In Less Than | Color of Insulating Strip | Size of Screws Slotted For | Fig. No. | Dimensions (Inches) | Mounting Centers (Inches) |
|-------------|---------------------------|----------------|--------------------------|---------------------------|----------------------------|----------|---------------------|---------------------------|
| (a) 35A | $1\frac{1}{3}$ | 2 | $1\frac{1}{2}$ Min. | White | No. 10 | 1 | $\frac{13}{64}$ | $\frac{13}{64}$ |
| (a) 35B | $1\frac{1}{3}$ | 2 | $1\frac{1}{2}$ Min. | White | No. 6 | 1 | $\frac{5}{32}$ | $\frac{13}{64}$ |
| | 2 | 3 | 3 Min. | Orange | No. 6 | | $\frac{13}{64}$ | $\frac{13}{64}$ |
| (a) 35C | 2 | 3 | 3 Min. | Orange | No. 10 | 1 | $\frac{13}{64}$ | $\frac{13}{64}$ |
| (a) 35D | $1\frac{1}{3}$ | 2 | $1\frac{1}{2}$ Min. | White | No. 6 | 1 | $\frac{5}{32}$ | $\frac{13}{64}$ |
| (a) 35E | 3 | 4 | 5 Min. | White | No. 6 | 1 | $\frac{5}{32}$ | $\frac{13}{64}$ |
| (a) 35F | $\frac{1}{2}$ | $\frac{3}{4}$ | $1\frac{1}{2}$ Min. | Red | No. 10 | 1 | $\frac{13}{64}$ | $\frac{13}{64}$ |
| (a) (b) 35G | 3 | $4\frac{1}{2}$ | 5 Min. | Blue | No. 6 | 1 | $\frac{5}{32}$ | $\frac{13}{64}$ |
| (a) 35H | 5 | $6\frac{1}{2}$ | 5 Min. | Green | No. 6 | 1 | $\frac{5}{32}$ | $\frac{13}{64}$ |
| (d) 35J | $\frac{1}{2}$ | $\frac{3}{4}$ | $1\frac{1}{2}$ Min. | Red | No. 10 | 1 | $\frac{13}{64}$ | $\frac{13}{64}$ |
| (e) 35K | $1\frac{1}{3}$ | 2 | 3 Min. | White | No. 10 | 2 | $\frac{13}{64}$ | $\frac{13}{64}$ |
| (e) 35L | 2 | 3 | 3 Min. | Orange | No. 10 | 2 | $\frac{13}{64}$ | $\frac{13}{64}$ |
| (e) 35M | 3 | $4\frac{1}{2}$ | 5 Min. | Blue | No. 6 | 2 | $\frac{5}{32}$ | $\frac{13}{64}$ |
| (e) 35N | 5 | $6\frac{1}{2}$ | 5 Min. | Green | No. 6 | 2 | $\frac{5}{32}$ | $\frac{13}{64}$ |
| (d) 35P | $\frac{3}{4}$ | $1\frac{1}{8}$ | $1\frac{1}{2}$ Min. | Tan | No. 10 | 1 | $\frac{13}{64}$ | $\frac{13}{64}$ |
| (a) (f) 35R | .180 | .270 | $1\frac{1}{2}$ Min. | Yellow | No. 10 | 1 | $\frac{13}{64}$ | $\frac{13}{64}$ |
| (g) 35S | $\frac{1}{4}$ | $\frac{3}{8}$ | $1\frac{1}{2}$ Min. | Pink | No. 10 | 1 | $\frac{13}{64}$ | $\frac{13}{64}$ |
| (a) (h) 35T | .65 | 1.1 | 3 Min. | Tan | No. 10 | 1 | $\frac{13}{64}$ | $\frac{13}{64}$ |

Terminals have tinned finish.

- (a) For use in circuits operating on voltages up to 90 volts.
- (b) Replaces No. 35B (3 ampere).
- (c) Replaces No. 35B (5 ampere).
- (d) For use in circuits operating on 90-160 volts. Fuse wire enclosed in glass tube to prevent side flash.
- (e) For use in circuits operating on 90-150 volts. Fuse wire enclosed in porcelain tube to prevent side flash.

- (f) Also satisfactory for use in circuits operating up to 160 volts if current is limited as covered in the standard equipment information on fuse boards.
- (g) For use in circuits operating on voltages up to 160 volts. Fuse wire enclosed in glass tube to prevent side flash.
- (h) Replaces D-176228.

Tubular Fuses



No. 7: Will operate in less than 5 minutes on 50% increase over rated capacity.

No. 11: Fuse wire enclosed in asbestos sleeving. Will operate in less than 5 minutes on 50% increase over rated capacity.

No. 55A: Consists of glass tube equipped at both ends with tinned caps to which fuse element attached.

No. 60: Fuse element enclosed in sleeve of insulating material.

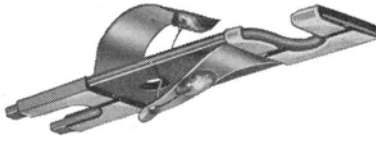
Dummy Fuses

No. 63A: Composed of black insulating material. Used on fuse panels in positions arranged for, but not equipped with Nos. 35A, B, C, F fuses.

| No. | Rated Capacity (Amp.) | Operate Value Less Than (Sec.) | Current (Amp.) | Used With |
|-----|-------------------------------|--------------------------------|----------------|--|
| 7A | 1, 2, 3, 4, 5, 7 as specified | | | 77, 98A, 98B, 1074A, 1075A, 1078A, 1093A Protectors |
| 7T | 7 | | | "B" Cable Terminals, Fuse Chambers |
| 11C | 7 | | | 2 No. 16, Nos. 16 and 29B, 52 or 79A and 80 Mountings Protector |
| 55A | 0.4 | | | No. 9A Fuse Post 58AP Protector, 16 Protector Mounting; 98A Protector, 94A Protector Mounting; 1079 AP Protector, 80A Protector Mounting |
| 60A | .350 | 210 | .500 | LA and LB Fuse Chambers |
| 60D | .350 | 210 | .500 | Battery Feeder Cir. in connection with LA and LB Cable Terminals |
| 60E | 1.25 | 210 | 1.80 | Exposed Charging Leads to Small P.B.X. and Wiring Plan Batteries |
| 60G | .500 | 210 | .750 | |

Fuses, Indicator Alarm Type

Cook (Grasshopper Fuses)



These fuses can be used to set off an alarm when fuse wire has separated causing the bottom spring to contact an alarm circuit.

This type fuse normally used on circuits operating up to 90 volts, but are also made for circuits up to 160 volts limited current, with fuse wire enclosed in glass or porcelain tube to prevent side flash.

When ordering, specify catalog number and rated capacity.

Indicator Alarm Type Fuses Grasshopper Fuses

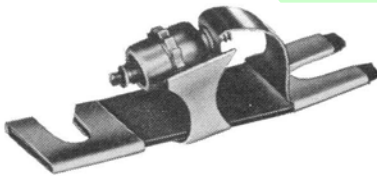
| No. | Ref. | Known As | Rated Capacity, Amp. | Amp. | Operates on In Less Than | Insulating Strip Color | Slotted for Screws No. | Slot Width | Dimensions, Inches Mounting Centers | Length Overall |
|--------|---------|----------|----------------------|-------|--------------------------|------------------------|------------------------|------------|-------------------------------------|----------------|
| 170-10 | (a) | 35A | 1 1/3 | 2 | 1 1/2 Min. | White | 10 | 13/64 | 1 3/16 | 1 43/64 |
| 170-11 | (a) | 35B | 1 1/3 | 2 | 1 1/2 Min. | White | 6 | 5/32 | 1 3/16 | 1 43/64 |
| 170-12 | (a) | 35B | 2 | 3 | 3 Min. | Orange | 6 | 5/32 | 1 3/16 | 1 43/64 |
| 170-13 | (a) | 35C | 2 | 3 | 3 Min. | Orange | 10 | 13/64 | 1 3/16 | 1 43/64 |
| 170-14 | (a) | 35D | 1 1/3 | 2 | 1 1/2 Min. | White | 6 | 5/32 | 1 1/8 | 1 5/8 |
| 170-15 | (a) | 35E | 3 | 4 | 5 Min. | White | 6 | 5/32 | 1 1/2 | 1 63/64 |
| 170-16 | (a) | 35F | 1/2 | 3/4 | 1 1/2 Min. | Red | 10 | 13/64 | 1 3/16 | 1 43/64 |
| 170-17 | (a) (b) | 35G | 3 | 4 1/2 | 5 Min. | Blue | 6 | 5/32 | 1 3/16 | 1 43/64 |
| 170-18 | (a) (c) | 35H | 5 | 6 1/2 | 5 Min. | Green | 6 | 5/32 | 1 3/16 | 1 43/64 |
| 170-19 | (d) | 35J | 1/2 | 3/4 | 1 1/2 Min. | Red | 10 | 13/64 | 1 3/16 | 1 43/64 |
| 170-20 | (e) | 35K | 1 1/3 | 2 | 3 Min. | White | 10 | 13/64 | 1 3/16 | 1 43/64 |
| 170-21 | (e) | 35L | 2 | 3 | 3 Min. | Orange | 10 | 13/64 | 1 3/16 | 1 43/64 |
| 170-22 | (e) | 35M | 3 | 4 1/2 | 5 Min. | Blue | 6 | 5/32 | 1 3/16 | 1 43/64 |
| 170-23 | (e) | 35N | 5 | 6 1/2 | 5 Min. | Green | 6 | 5/32 | 1 3/16 | 1 43/64 |
| 170-24 | (d) | 35P | 3/4 | 1 1/3 | 1 1/2 Min. | Tan | 10 | 13/64 | 1 3/16 | 1 43/64 |
| 170-25 | (a) (f) | 35R | .180 | .270 | 1 1/2 Min. | Yellow | 10 | 13/64 | 1 3/16 | 1 43/64 |
| 170-26 | (g) | 35S | 1/4 | 3/8 | 1 1/2 Min. | Pink | 10 | 13/64 | 1 3/16 | 1 43/64 |
| 170-27 | (a) | 35T | .65 | 1.1 | 3 Min. | Tan | 10 | 13/64 | 1 3/16 | 1 43/64 |

References:

- (a) For circuits operating on voltages up to 90 volts.
- (b) Replaces 35B, 3-ampere fuse.
- (c) Replaces 35B, 5-ampere fuse.
- (d) For circuits operating on voltages 90 to 160 volts. Fuse wire enclosed in glass tube.
- (e) For circuits operating on voltages 90 to 150 volts. Fuse wire enclosed if porcelain tube to prevent side flash.
- (f) Satisfactory for circuits operating on voltages up to 160 volts if current is limited as covered in standard equipment information on fuse boards.
- (g) For circuits operating on voltages up to 160 volts. Fuse wire enclosed in glass tube to prevent side flash.

Fuses, Resettable, Grasshopper

Cook



Combination of grasshopper fuse and heat coil provides a new economical and positive acting fuse, arc free, with accurate operation time. Is now available to wire communications and electronic equipment. Resettable by re-engaging heat coil ratchet. Parts easily replaceable.

Heat coil operation simple and positive. When subject to more than rated current, the ratchet releases the ground and alarm spring. After trouble has been cleared, and current flow is normal, fuse can be reset manually by ratchet which is again locked into position.

Table Showing Interchangeability of Heat Coil Type GRASSHOPPER FUSES

| No. | Code No. | Rated Resistance (Ohms) | Will Carry for 3 Hr. Current of (Ampere) | Will Operate in 210 Seconds on Current of (Ampere) | Size Screw Slotted for No. | Mounting Centers |
|---------|----------|-------------------------|--|--|----------------------------|------------------|
| Note 1 | Note 2 | Max. | Min. | | | |
| 170-509 | 74-A | 21.0 | 19.0 | .10 | .18 | 6 1 1/2 |
| 170-510 | 74-B | 4.1 | 3.7 | .24 | .40 | 10 1 3/16 |
| 170-511 | 74-C | 8.0 | 6.5 | .185 | .265 | 10 1 1/2 |
| 170-512 | 74-E | 8.0 | 6.5 | .185 | .265 | 10 1 3/16 |
| 170-513 | 74-F | 57 | 53 | .055 | .110 | 10 1 1/2 |
| 170-514 | 74-G | 57 | 53 | .055 | .110 | 10 1 3/16 |

Note 1: Cook Electric Company Reusable Fuse

Note 2: Western Electric Heat Coil Replaceable Fuse

Table Showing Interchangeability of GRASSHOPPER FUSES* & RESETTABLE GRASSHOPPER FUSES

| Cook Part No. | Known As | Rated Capacities (Amp.) | Operates On Less Than Amp. | Color Insulating Strip | Size Screw Slotted for No. | Slot Width, In. | Mounting Centers |
|---------------|----------|-------------------------|----------------------------|------------------------|----------------------------|-----------------|------------------|
| 170-550 | 35A | 1 1/3 | 2 | 1 1/2 | White | 10 | 13/64 |
| 170-551 | 35B | 1 1/3 | 2 | 1 1/2 | White | 6 | 5/32 |
| 170-552 | 35B | 2 | 3 | 3 | Orange | 6 | 5/32 |
| 170-553 | 35C | 2 | 3 | 3 | Orange | 10 | 13/64 |
| 170-554 | 35D | 1 1/3 | 2 | 1 1/2 | White | 6 | 5/32 |
| 170-555 | 35E | 3 | 4 | 5 | White | 6 | 5/32 |
| 170-556 | 35F | 1/2 | 3/4 | 1 1/2 | Red | 10 | 13/64 |
| 170-557 | 35G | 3 | 4 1/2 | 5 | Blue | 6 | 5/32 |
| 170-558 | 35H | 5 | 6 1/2 | 5 | Green | 6 | 5/32 |
| 170-559 | 35J | 1/2 | 3/4 | 1 1/2 | Red | 10 | 13/64 |
| 170-560 | 35K | 1 1/3 | 2 | 3 | White | 10 | 13/64 |
| 170-561 | 35L | 2 | 3 | 3 | Orange | 10 | 13/64 |
| 170-562 | 35M | 3 | 4 1/2 | 5 | Blue | 6 | 5/32 |
| 170-563 | 35N | 5 | 6 1/2 | 5 | Green | 6 | 5/32 |
| 170-564 | 35P | 3/4 | 1 1/3 | 1 1/2 | Tan | 10 | 13/64 |
| 170-565 | 35R | .180 | .270 | 1 1/2 | Yellow | 10 | 13/64 |
| 170-566 | 35S | 1/4 | 3/8 | 1 1/2 | Pink | 10 | 13/64 |
| 170-567 | 35T | .64 | 1.1 | 3 | Tan | 10 | 13/64 |

Overload Failure Warning Relay

Accessory item for operation with Grasshopper fuses. It energizes when Grasshopper fuse operates and shorts against the bus. The relay coil connected in series with bus then energizes and warning contacts close. Operates at 24 or 48 volts, d-c; or with external shunt removed 135 and 165 volts, d-c.

Fuses, Precision Rated

Cook



Telephone fuses designed for use in Cook protectors and terminals. Interchangeable with corresponding types of telephone fuses.

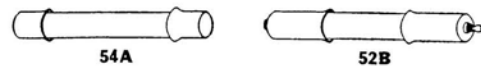
| No. | Description | Used in |
|-----------------|------------------------|------------------------|
| 59-0700 | A-7 Wood, 5 Amperes | S-6, H-29D, O-7, UA-20 |
| 146-0900 | A-9 Lavite, 5 Amperes | B-7, O-9, RO |
| *146-217 | A-9u Lavite, 7 Amperes | O-9u, RO-9u |
| 498-6300 | A-63 Fiber, 5 Amperes | M-16-F |
| 424-5200 | A-52 Fiber, 5 Amperes | O-52 |
| 149-1600 | A-16 Wood, 5 Amperes | O-16 |
| 494-6200 | A-62 Fiber, 5 Amperes | O-62 |
| 214-2200 | A-22 Lavite, 5 Amperes | 10-W, 105 |
| 499-6400 | A-64 Wood, 5 Amperes | O-64 |
| 307-4600 | A-46 Wood, 5 Amperes | H-36, O-46 |
| 306-4500 | A-45 Lavite, 5 Amperes | H-36, O-45 |
| 91-1200 | A-12 Lavite, 5 Amperes | H-51, O-12 |

Note: Part numbers on all fuses should be as shown above except last digit to be the same as amperage required.

*Listed as standard by Underwriters' Laboratories.

Fuses, Telephone and Telegraph

Bussmann



| Symbol No. | Length, In. | Diameter, In. | Old No. | Amperes |
|------------|---------------------------------|---------------------------------|---------|------------------------------------|
| 54A | 1 ¹⁵ / ₁₆ | 25 ³ / ₆₄ | | 5 |
| 57A | 2 ⁵ / ₈ | 25 ³ / ₆₄ | | 1, 3 or 10 |
| 57C | 2 ⁵ / ₈ | 25 ³ / ₆₄ | | 5/10 |
| HVA | 3 | 25 ³ / ₆₄ | 5538 | 1 ¹ / ₂ to 2 |
| 54B | 3 ³ / ₁₆ | 25 ³ / ₆₄ | | 2 |
| HVB | 4 ¹ / ₂ | 25 ³ / ₆₄ | 5568 | 1 ¹ / ₂ to 2 |
| HLA | 4 ¹⁹ / ₃₂ | 25 ³ / ₆₄ | 5530 | 8/10 |
| HLA | 4 ¹⁹ / ₃₂ | 25 ³ / ₆₄ | 5530 | 3 or 10 |
| HNA | 5 ¹ / ₁₆ | 25 ³ / ₆₄ | 5534 | 1 ¹ / ₄ |
| HVC | 5 ¹ / ₂ | 25 ³ / ₆₄ | 5558 | 1 ¹ / ₂ to 2 |
| 52B | 2 ¹¹ / ₁₆ | 25 ³ / ₆₄ | | 8/10 |
| 51B | 4 ³ / ₃₂ | 21 ¹ / ₃₂ | | 14 |
| 1B | 4 ¹ / ₃₂ | 9 ¹ / ₁₆ | | 10 |
| 1C | 4 ¹ / ₃₂ | 9 ¹ / ₁₆ | | 10 |
| Symbol No. | Center to Center, In. | Slot, In. | Amperes | |
| 101A | 1 ¹ / ₂ | 3 ¹ / ₁₆ | 7 | |

Fuses

Reliable

Mica



Provided with copper terminals, these fuses are stocked in 1/4 and 1/2 amperes. Enclosed type will be shipped unless otherwise specified. Order by catalog number and amperage desired. Std. Pkg. 50; shipping weight 1/2 Lb. per 100.

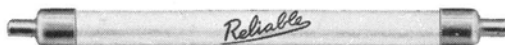
Western Union Type

| No. | Length, In. | Width, In. |
|------------|-------------------------------|-------------------------------|
| 8 | 2 ¹ / ₈ | 3 ³ / ₈ |
| 19 | 2 | 3 ³ / ₈ |
| 22 | 2 ¹ / ₂ | 1 ¹ / ₂ |
| 235 | 2 | 1 ¹ / ₂ |
| 310 | 3 | 1 ¹ / ₂ |

Postal Type

| No. | Length, In. | Width, In. |
|------------|------------------------------------|-------------------------------|
| 11 | 2 ¹ / ₈ | 3 ³ / ₈ |
| 21 | 2 | 3 ³ / ₈ |
| 25 | 2 ¹ / ₂ | 1 ¹ / ₂ |
| 137 | 1 ⁷ / ₈ or 2 | 1 ¹ / ₄ |

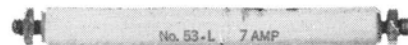
Terminal and Protector Fuses



Sizes and types for every telephone protector and cable terminal supplied in wood, fibre or ceramic. When ordering specify catalog number and amperage desired. Unless amperage is on order, seven ampere fuses will be supplied. Also available in one, three and five ampere capacities.

| No. | Material | Tip Diam., In. | Lgth., Shoulder to Shoulder, In. | Std. Pkg. | Ship. Wt. Lbs. Per 100 |
|-------------|----------|---------------------------------|----------------------------------|-----------|------------------------|
| 27L | Ceramic | 13 ¹ / ₆₄ | 4 ³ / ₄ | 50 | 7 |
| 35L | Ceramic | 13 ¹ / ₆₄ | 3 ⁷ / ₈ | 50 | 5 |
| *77L | Ceramic | 13 ¹ / ₆₄ | 4 ³ / ₄ | 50 | 6 |
| 95L | Ceramic | 13 ¹ / ₆₄ | 4 | 50 | 5 |
| 31L | Ceramic | 13 ¹ / ₆₄ | 3 | 50 | 4 |
| 106 | Fibre | 1 ¹ / ₆₄ | 3 ¹ / ₁₆ | 50 | 3 |

3/8-inch Nuted End Fuses



| No. | Material | Fuse Diam., In. | Lgth., Shoulder to Shoulder, In. | Std. Pkg. | Ship. Wt. Lbs. Per 100 |
|-------------|----------|--------------------------------|----------------------------------|-----------|------------------------|
| 53L | Ceramic | 7 ¹ / ₁₆ | 3 ³ / ₄ | 50 | 5 |
| *55L | Ceramic | 7 ¹ / ₁₆ | 4 ¹ / ₁₆ | 50 | 5 |

1/16-inch Nuted End Fuses

3/32 Threaded Tip



| No. | Material | Fuse Diam., In. | Lgth., Shoulder to Shoulder, In. | Std. Pkg. | Ship. Wt. Lbs. Per 100 |
|-----------|----------|--------------------------------|----------------------------------|-----------|------------------------|
| 56 | Fibre | 7 ¹ / ₁₆ | 4 ¹ / ₁₆ | 50 | 5 |

Flat Tipped Fibre Fuses



| No. | Material | Fuse Diam., In. | Lgth., Shoulder to Shoulder, In. | Std. Pkg. | Ship. Wt. Lbs. Per 100 |
|-----------|----------|--------------------------------|----------------------------------|-----------|------------------------|
| 52 | Fibre | 7 ¹ / ₁₆ | 3 ¹ / ₂ | 50 | 3 |

Heat Coil Fuses



| No. | Used In | Fuse Diam., In. | Shoulder to Shoulder, In. | Std. Pkg. | Amp. |
|-------------|---------------------|--------------------------------|--------------------------------|-----------|------|
| 107H | 303 Protector | 3 ³ / ₈ | 3 ¹ / ₁₆ | 50 | .35 |
| 115H | 308 Protector | 5 ¹ / ₁₆ | 3 ¹ / ₁₆ | 100 | .35 |
| 52B | Telegraph Protector | 3 ³ / ₈ | 2 ⁵ / ₈ | 100 | .8 |

*Approved and listed by Underwriters' Lab. in 7 amp. capacity.

Lamps Western Electric



No. 2

Carbon Filament Lamps used with Nos. 12, 30, 34, 49, 50 or similar type lamp sockets.

| No. | Voltage | Current Consumption | |
|-----|---------|---------------------|-----------|
| | | Min. Amp. | Max. Amp. |
| 2C | 15 | .103 | .120 |
| 2E | 20 | .090 | .120 |
| 2F | 12 | .105 | .120 |
| 2G | 24 | .075 | .115 |
| 2J | 24 | .018 | .033 |
| 2K | 30 | .090 | .120 |
| 2R | 18 | .090 | .120 |
| 2T | 40 | .034 | .046 |
| 2U | 24 | .035 | .048 |
| 2W | 18 | .035 | .045 |
| 2Y | 48 | .030 | .042 |

Tungsten Filament Lamps

Used with Nos. 12, 30, 34 or similar type Lamp Sockets.

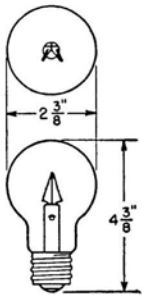
| | | | |
|----|----|------|------|
| A1 | 24 | .033 | .045 |
| A2 | 24 | .075 | .105 |
| A3 | 24 | .033 | .045 |
| B2 | 18 | .036 | .048 |
| C2 | 36 | .032 | .044 |
| E1 | 6 | .033 | .045 |
| E2 | 6 | .270 | .310 |
| E3 | 6 | .120 | .160 |
| F1 | 4 | .170 | .210 |
| F2 | 4 | .270 | .310 |

| | | | |
|----|----|------|------|
| G1 | 8 | .085 | .100 |
| G2 | 8 | .035 | .050 |
| H1 | 16 | .270 | .310 |
| J1 | 10 | .230 | .270 |
| K1 | 30 | .033 | .045 |
| K2 | 30 | .032 | .044 |

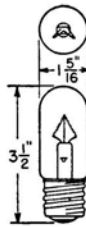
The No. 51A Lamp is a tungsten filament lamp intended for use in illuminated push-button telephone sets. The rated voltage of this lamp is 10 volts and at this voltage the current consumption is maximum .045 ampere and minimum .035 ampere and the minimum illumination is 200 end-foot candles.

Lamps, Ballast Western Electric

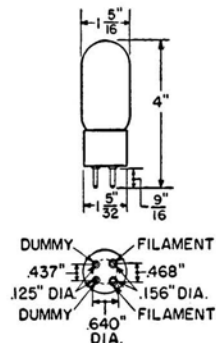
Current regulators designed to maintain approximately constant current within a rated voltage range.



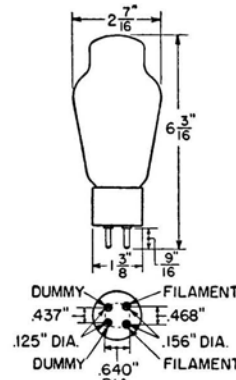
Nos. 5A and 5B



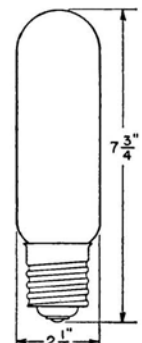
Nos. 7A and 7B



Nos. 120A, 121B, and 122A



No. 123A



No. 124A

| Code No. | Voltage Range | Ballasted Current Amperes |
|----------|---------------|---------------------------|
| 4B | 3 to 9.5 | 1.07 to 1.17 at 90 |
| 5A | 3 to 9.5 | .940 to 1.010 at 90 |
| 5B | 3 to 9.5 | 1.07 to 1.16 at 90 |
| 7A | 3 to 10 | .490 to .530 at 90 |
| 8A | 3 to 10 | .485 to .525 at 90 |
| 120A | 5.5 to 12 | .430 at 70 |
| 121B | 5.5 to 12 | .870 at 70 |
| 122A | 3.0 to 7.5 | 1.9 at 70 |
| 123A | 4.0 to 12.0 | 3.0 at 70 |
| 124A | 5.0 to 12.0 | 10.0 \pm 17% at 70 |
| 126B | 5.5 to 14.5 | 0.97 \pm .03 at 70 |

Mounting

143B Electron Tube Socket
143B
143B
143B
Standard Mogul Screw Base
Medium Screw Base

Use

{ Carrier Current Equipment to maintain a constant current in the filament circuit of electron tubes.
Telephone Repeater Circuits.
C3 & C4 Carrier Telephone Systems.
Carrier Telephone System.
Carrier Telephone System.
17B Oscillator.
Battery charging equipment J-86207
Carrier Telephone and Telegraph Systems.

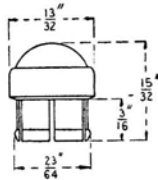
Caps, Lamp

Western Electric

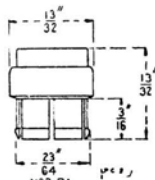
Thick, substantial lenses made from specially selected and treated glass unless otherwise noted. Lenses held firmly in place in cap cases by spinning the edges over the lenses. Slotted cases give spring fit for cap in socket.



No. 2A



No. 2A Type
Except No. 2BA



No. 2BA

No. 2 Lamp Cap: Used with Nos. 12, 49 and 50 Lamp Sockets. Diameter $1\frac{13}{32}$ in.

| No. | Symbol | Color |
|------|--------|------------------|
| 2A | ⊖ | White opalescent |
| 2B | ⊙ | White opalescent |
| 2C | ⊕ | White opalescent |
| 2D | ⊗ | White opalescent |
| 2E | ⊖ | White opalescent |
| 2F | ⊙ | White opalescent |
| 2G | ⊕ | White opalescent |
| 2H | ⊗ | Red opalescent |
| 2J | ⊖ | White opalescent |
| 2K | ⊙ | White opalescent |
| 2L | ⊕ | Green opalescent |
| 2M | ⊗ | White opalescent |
| 2N | ⊖ | Red opalescent |
| 2P | ⊙ | Jeweled red |
| 2R | ⊕ | Jeweled blue |
| 2S | ⊗ | Jeweled green |
| 2T | ⊖ | Red opalescent |
| 2U | ⊙ | Amber |
| 2W | ⊕ | Blue |
| 2Y | ⊗ | Green opalescent |
| 2Z | ⊖ | White opalescent |
| 2AA | ⊙ | Red opalescent |
| 2AB | ⊕ | White opalescent |
| 2AC | ⊗ | Red opalescent |
| 2AE | ⊖ | Red opalescent |
| 2AF | ⊙ | White opalescent |
| 2AG | ⊕ | White opalescent |
| 2AH | ⊗ | White opalescent |
| 2AJ | ⊖ | White opalescent |
| 2AK | ⊙ | White opalescent |
| 2AL | ⊕ | Green opalescent |
| 2AM | ⊗ | White opalescent |
| 2AN | ⊖ | White opalescent |
| 2AP | ⊙ | White opalescent |
| 2AS | ⊕ | White opalescent |
| 2AT | ⊗ | White opalescent |
| 2AU | ⊖ | White opalescent |
| 2AW | ⊙ | White opalescent |
| 2AY | ⊕ | White opalescent |
| 2AZ | ⊗ | Red opalescent |
| 2BA* | ⊖ | White opalescent |
| 2BC | ⊙ | White opalescent |

| No. | Symbol | Color |
|-----|--------|------------------------------|
| 2BD | ⊖ | White opalescent |
| 2BE | ⊙ | Green opalescent |
| 2BF | ⊕ | White opalescent |
| 2BG | ⊗ | Green opalescent |
| 2BH | ⊖ | Green opalescent |
| 2BJ | ⊙ | White opalescent |
| 2BN | ⊕ | Clear |
| 2BP | ⊗ | Clear amber |
| 2BR | ⊖ | White (Moulded Plastic Lens) |
| 2BS | ⊙ | Red (Moulded Plastic Lens) |
| 2BT | ⊕ | Green (Moulded Plastic Lens) |

*Numbered as specified in order. Lens has flat top.



No. 4D

Nos. 4A to M Lamp Caps: Used with Nos. 34 and 53A lamp sockets.

Nos. 4N to S Lamp Caps: Used with No. 20B or similar indicators.

Used for pilot signals, fire alarms, supervisor's signals' other classes of work in mounting large signal.

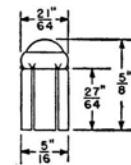
| No. | Symbol | Color |
|-----|--------|-------------------|
| 4A | ⊖ | White opalescent |
| 4B | ⊙ | *Red opalescent |
| 4C | ⊕ | *Green opalescent |
| 4D | ⊗ | Red opalescent |
| 4F | ⊖ | Green opalescent |
| 4G | ⊙ | White opalescent |
| 4M | ⊕ | Clear amber |
| †4N | ⊗ | White opalescent |
| †4P | ⊖ | Red opalescent |
| †4R | ⊙ | Green opalescent |
| †4S | ⊕ | Clear amber |

*Jeweled.

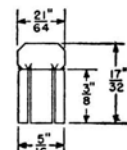
†Inside surface of lens is concave.



No. 8Y



No. 8 Type,
Except No. 8BD



No. 8BD

Caps, Lamp (Con't)

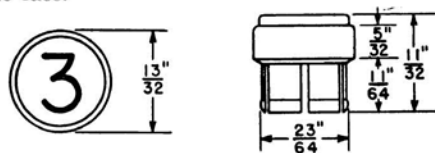
Western Electric

No. 8 Lamp Caps: Used with No. 30 Lamp Sockets.
Overall diameter $2\frac{1}{64}$ in.

| No. | Symbol | Color |
|------|--------|------------------|
| 8A | ○ | White opalescent |
| 8B | ○ | Clear |
| 8D | ○ | Red opalescent |
| 8E | ● | White opalescent |
| 8F | ● | White opalescent |
| 8G | ⊖ | White opalescent |
| 8H | ⊖ | White opalescent |
| 8J | ⊕ | White opalescent |
| 8K | ⊙ | White opalescent |
| 8L | ○ | Green opalescent |
| 8Y | ● | Green opalescent |
| 8AC | ● | Red opalescent |
| 8AH | Ⓟ | White opalescent |
| 8AY | Ⓢ | White opalescent |
| *8BB | Ⓜ | White opalescent |
| 8BC | Ⓒ | White opalescent |
| †8BD | ❶ | White opalescent |

*Numbered with one or two black digits as specified in order.

†White opalescent painted black except for raised bar across the face.



No. 72 Type

No. 72 type (White Opalescent Numbers on Black Background except Nos. 72L, M and N, which have White, Red and Green Backgrounds with Black Characters). Used with Nos. 12 and 49A type Lamp Sockets.

| Code No. | Symbol | Code No. | Symbol |
|----------|--------|----------|-------------|
| 72A | ① | 72G | ⑥ |
| 72B | ① | 72H | ⑦ |
| 72C | ② | 72I | ⑧ |
| 72D | ③ | 72K | ⑨ |
| 72E | ④ | 72L* | Ⓛ ⑫ ⑬ |
| 72F | ⑤ | 72M* | |
| | | 72N* | |

*Characters as specified in order. One, two or three characters will be arranged on one line; four characters on two lines.