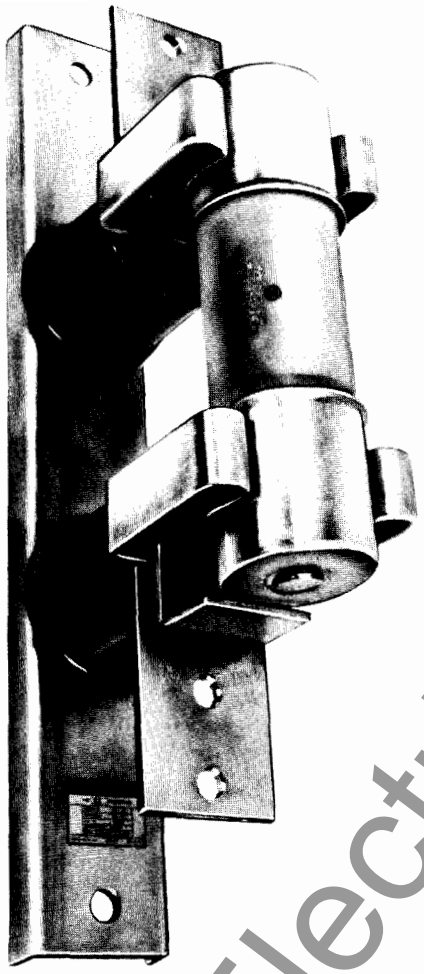
Westinghouse Electric Corporation
Switchgear Division
East Pittsburgh, PA 15112

June, 1978
Supersedes DB 36-651
dated August, 1967

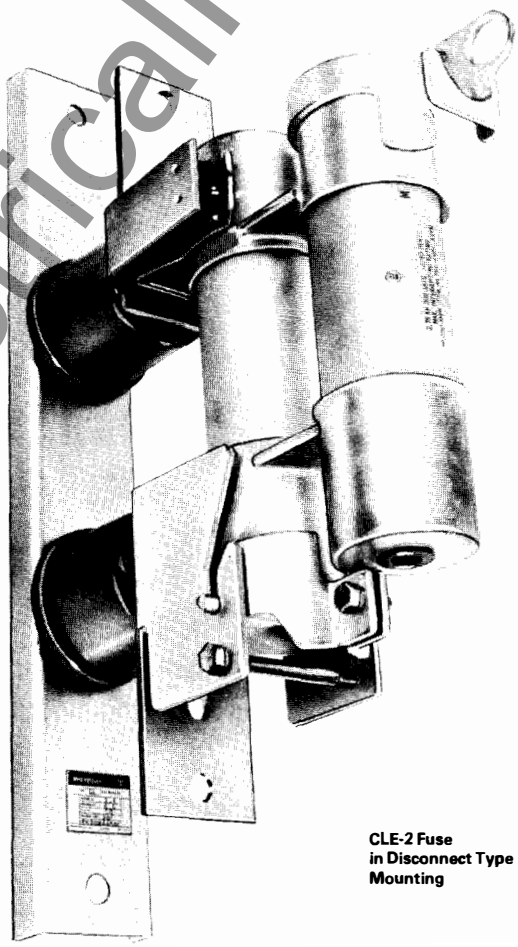
Mailed to: E, D, C/1971/DB

Indoor and Outdoor Current Limiting
600 to 23,000 Volts
.5E to 750E Amperes
50/60 Hertz and Special Types

Types CLV, CLE-PT, CLE, CLE-1, -2, -3, -750 and CLO High Voltage Power Fuses



CLE-1 Fuse in Non-disconnect Type Mounting



CLE-2 Fuse in Disconnect Type Mounting

Application
Current limiting fuse should be applied wherever it is necessary to limit short circuit currents on high capacity systems. The fuse will operate in approximately one-half cycle to provide maximum protection to the apparatus on the system. Current limiting fuses are applied in industrial installations and commercial buildings for:

- Potential Transformer Protection
- Power Transformer Protection
- Power Centers
- Load Interrupters
- Control Power Transformer Protection
- Feeder Circuit Protection
- Unit Substations

Advantages

Quiet Safe Operation
Designed for silent operation and elimination of flame discharges when fuse blows.

Easy Identification of Blown Fuse
Indicator will protrude from the bottom end of indicating type fuse providing a visual aid when fuse has blown.

Space Economy
The fuse being designed for elimination of flame or gas discharges when operated, requires no discharge filters, fire boxes, special vents or reinforcing.

Complete Protection Provided
Current limiting fuses insure positive interruption even on low fault currents. The fuse limits the magnitude of electro-mechanical stresses in the apparatus to be protected. They also control the surge voltage that is produced when the short circuit current is limited to less than twice that of the nominal voltage rating.

Fatigue Proof
Bending or spiralling of the silver elements prior to assembly permits the current limiting fuse to stand up under the most severe duty cycling without failure.

Interchangeable
Many fuses are mechanically interchangeable and carry the same current rating as competitive current limiting fuses. Refer to page 4 for competitive interchangeability chart.

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Typical Applications

Potential Transformer Protection
Complete line of Type CLE-PT current limiting potential transformer fuses of ½ E ampere rating are available from 2400 volts to 23,000 volts. For circuits of 600 volts and below, the CLV current limiting fuses are available.

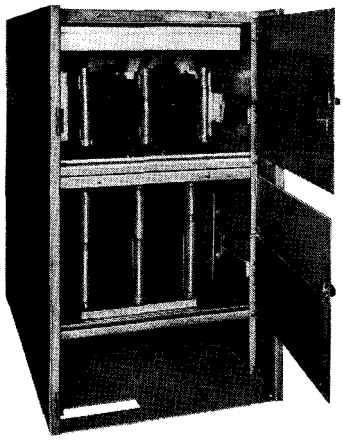

Figure 1: Type CLE-PT fuses mounted on disconnecting type potential transformer in metal-clad switchgear.

Transformer Protection
Current limiting fuse Types CLE, CLE-1 and CLE-2 are particularly suitable for transformer short circuit protection. They are generally applied on the primary side of transformers to:

1. Protect the system against outages.
2. Protect against bolted secondary faults.
3. Coordinate with protective devices on the low side.
4. Protect against higher impedance secondary faults to whatever extent is feasible.

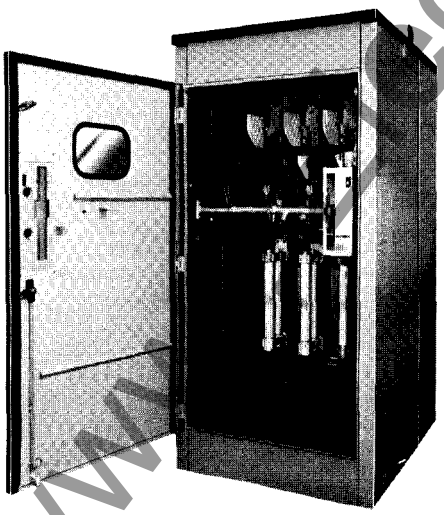

Figure 2: Type AWP primary load break switch with CLE-12 fuses.

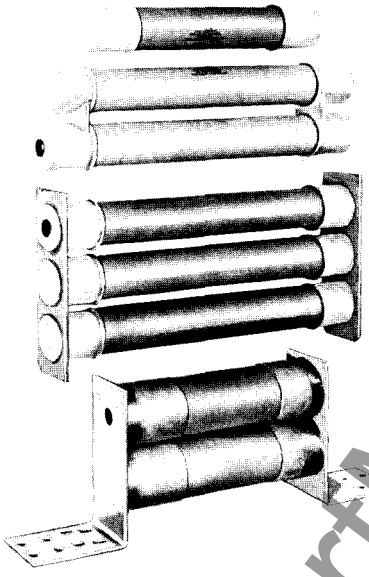

Figure 3: The CLE family of power fuses.

Type CLE power fuses are basically of inorganic construction, the only organic material used being the glass-resin outer casing and the plastic indicator. The fuse elements are pure silver designed to combine maximum load carrying ability with the most favorable short circuit interruption characteristics plus being "fatigue proof". This added feature is made possible by bending or spiralling the element prior to assembly, making the element structurally stronger and distributing expansion uniformly to withstand the most severe type of duty cycling without failure. The CLE fuses are filled with a high purity silica sand of controlled grain size, and sandwiched between the sand filling is an additional layer of pulverant arc quenching material. The addition of this band of filler to the fuse changes its melting characteristics, and facilitates low current interruption making it more suitable for transformer protection.

The non-indicating type of fuse, such as the BAL-1, CLV and CLE-PT, utilizes the silver element, sand and "fatigue proof" features of larger indicating types of fuses except that the element and sand are enclosed in an alumina porcelain tube. These fuses have a $^{13}/_{16}$ inch ferrule diameter and can be used in a BAL-1 type mounting.

CLE-12 and CLE-22, 2.4/4.8 kv, fuses have the same range of E ratings, melting time and mechanical characteristics as the CLE-1 and CLE-2 except that they have a hookeye, 12 inch fuse clip center and maximum design voltage of 5.5 kv.

The CLO fuse is similar to the CLE fuse with the exception that the CLO is for outdoor application. The CLO fuse has a glass melamine outer casing and weatherproof coating designed to resist the effects of outdoor weathering.

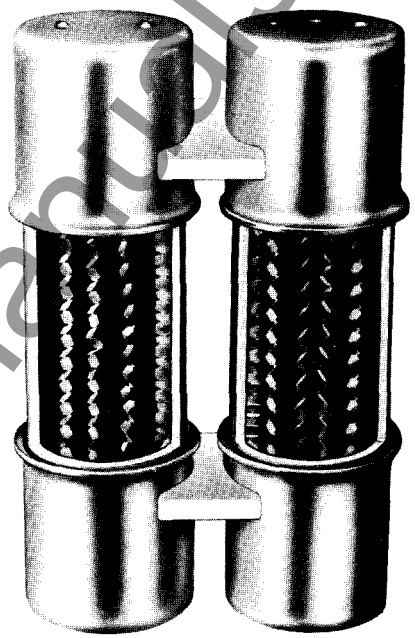

Figure 4: Cutaway view of type CLE-2 fuse showing pure silver elements.

Construction

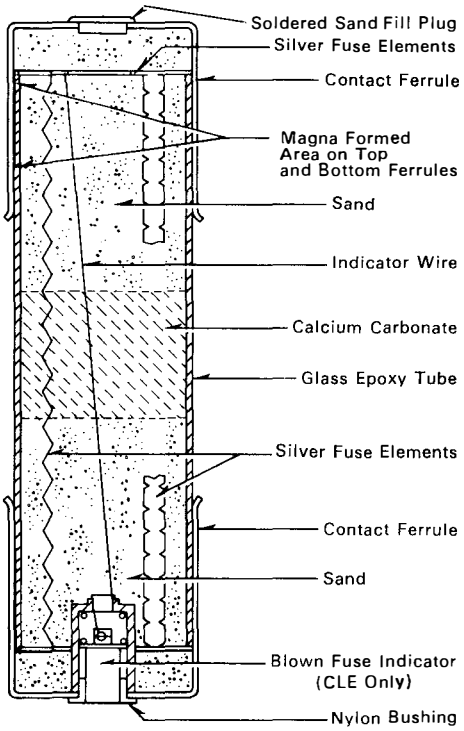

Figure 5: Cross-section drawing showing component parts of a type CLE-1 fuse unit.

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Fuse Mountings

Mounting devices for current limiting fuses are available in a wide variety of types and sizes. Potential transformer fuses can be mounted directly on the potential transformers or on drawout carriages. Higher current ratings require a separate fuse support.

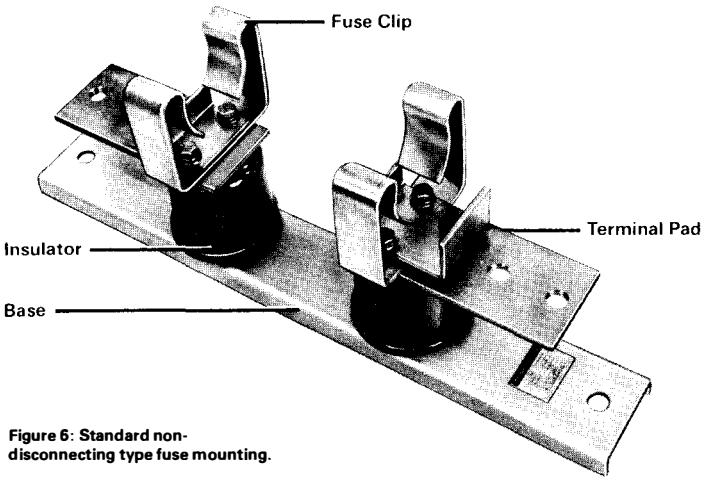


Figure 6: Standard non-disconnecting type fuse mounting.

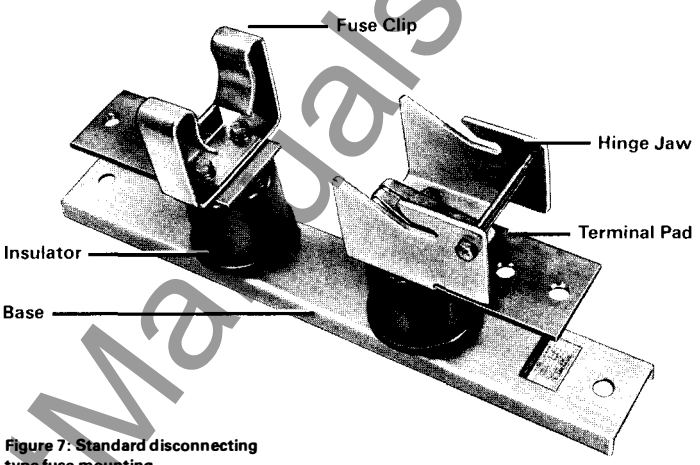


Figure 7: Standard disconnecting type fuse mounting.

Live Parts

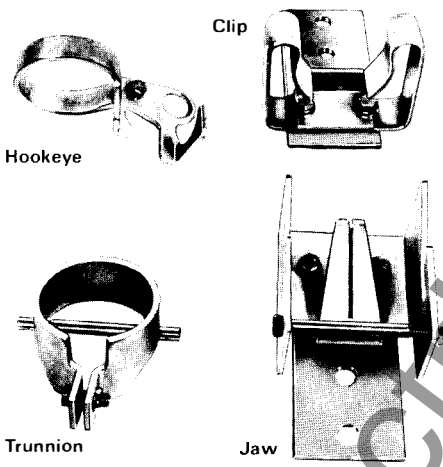


Figure 8: Live parts above insulator for CLE-1.

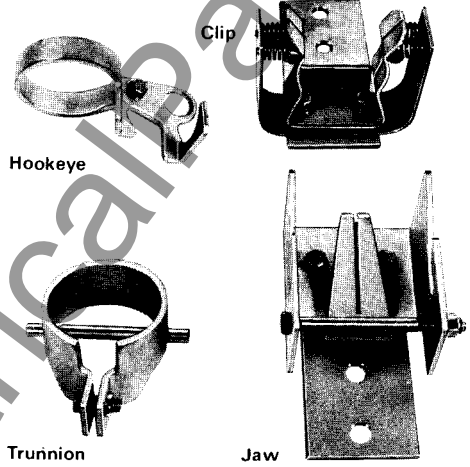


Figure 9: Live parts above insulator for CLE-2.

Fuse Fittings

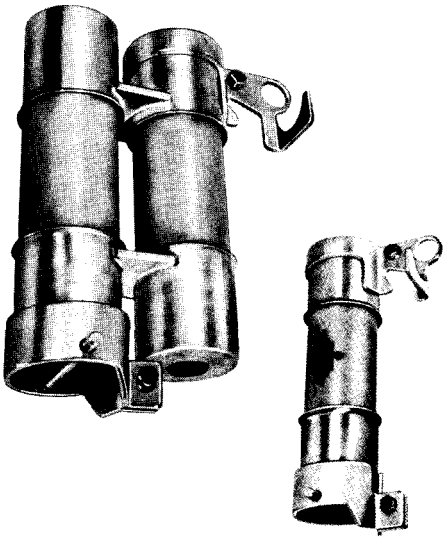
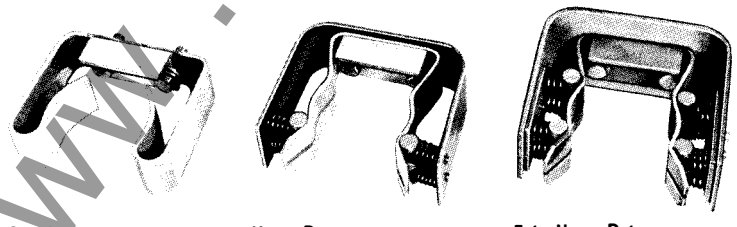


Figure 11: Fuse fittings are easily removed from blown fuse and clamped on new fuse tube.

Fuse Clips

The standard clip is used with the CLE-1 fuse for currents not exceeding 230 amps; the heavy duty clip with the CLE-2 fuse up to 450X and the extra heavy duty clip for CLE-3 fuses only.



Standard **Heavy Duty** **Extra Heavy Duty**

Figure 10

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Fuse Interchangeability Chart

The following information lists other manufacturer's fuse styles for which we have an interchangeable fuse unit or mounting. These fuses are mechanically interchangeable and carry the same current rating. For close coordination the time-current curves should be checked to assure desired selectivity. Included in the list are the manufacturer's style listed alpha-numerically, the Westinghouse style, current rating, voltage rating and type of fuse.

Bussman

Buss Style	Style	Amps	KV	Fuse
JCY 30E	151D978G01	30E	5.5	CLE-12
JCY 50E	151D978G02	50E	5.5	CLE-12
JCY 65E	151D978G03	65E	5.5	CLE-12
JCY 80E	151D978G04	80E	5.5	CLE-12
JCY 100E	151D978G05	100E	5.5	CLE-12
JCY 125E	151D978G06	125E	5.5	CLE-12
JCY 150E	151D978G07	150E	5.5	CLE-12
JCY 200E	151D978G08	200E	5.5	CLE-12

ITE

I T E Style	Style	Amps	KV	Fuse
427505	151D978G01	30E	5.5	CLE-12
427508	151D978G02	50E	5.5	CLE-12
427509	151D978G03	65E	5.5	CLE-12
427510	151D978G04	80E	5.5	CLE-12
427511	151D978G05	100E	5.5	CLE-12
427512	151D978G06	125E	5.5	CLE-12
427515	151D978G07	150E	5.5	CLE-12
427516	151D978G08	200E	5.5	CLE-12
427572①	151D978G11	250E/280X	5.5	CLE-22
427574②	151D978G13	400E	5.5	CLE-22

① Rated 270 A
② Rated 362 A

Nelson

Nelson Style	Style	Amps	KV	Fuse
30E5	151D978G01	30E	5.5	CLE-12
50E5	151D978G02	50E	5.5	CLE-12
65E5	151D978G03	65E	5.5	CLE-12
80E5	151D978G04	80E	5.5	CLE-12
100E5	151D978G05	100E	5.5	CLE-12
125E5①	151D978G06	125E	5.5	CLE-12
150E5①	151D978G07	150E	5.5	CLE-12
200E5①	151D978G08	200E	5.5	CLE-12

① Nelson's fuse is double barrel.

General Electric

G. E. Style	Style	Amps	KV	Fuse
9F60AAA005	677C593G02	5E	.6	CLV
9F60AAA007	677C593G03	7E	.6	CLV
9F60AAA010	677C593G04	10E	.6	CLV
9F60AAB001	677C592G03	1E	2.8	CLE-PT
9F60AAB002	677C592G04	2E	2.8	CLE-PT
9F60BDD001	677C452G06	1E	5.5	CLE-PT
9F60BDD003	677C453G07	3E	5.5	CLE-PT
9F60BDD905	677C452G01	.5E	5.5	CLE-PT
9F60BDE905	677C452G02	.5E	8.3	CLE-PT
9F69BHH001	677C452G08	1E	15.5	CLE-PT
9F60BHH905	677C452G03	.5E	15.5	CLE-PT
9F60CCB015	678C240G01	15E	2.8	CLE
9F60CCB020	678C240G02	20E	2.8	CLE
9F60CCB025	678C240G03	25E	2.8	CLE
9F60ECB030	449D797G02	30E	2.8	CLE-1
9F60ECB040	449D797G12	40E	2.8	CLE-1
9F60ECB050	449D797G03	50E	2.8	CLE-1
9F60ECB065	449D797G04	65E	2.8	CLE-1
9F60ECB080	449D797G05	80E	2.8	CLE-1
9F60ECB100	449D797G06	100E	2.8	CLE-1
9F60FJD030④	151D978G01	30E	5.5	CLE-12
9F60FJD050④	151D978G02	50E	5.5	CLE-12
9F60FJD065④	151D978G03	65E	5.5	CLE-12
9F60FJD080④	151D978G04	80E	5.5	CLE-12
9F60FJD100④	151D978G05	100E	5.5	CLE-12
9F60GCB125	449D797G07	125E	2.8	CLE-1
9F60GCB150	449D797G08	150E	2.8	CLE-1
9F60GCB200	449D797G09	200E	2.8	CLE-1
9F60HJD125①④	151D978G06	125E	5.5	CLE-12
9F60HJD150①④	151D978G07	150E	5.5	CLE-12
9F60HJD200①④	151D978G08	200E	5.5	CLE-12
9F60GJC250②	151D978G11	250E	5.5	CLE-22
9F60GJC300②	151D978G12	300E	5.5	CLE-22
9F60GJC325②	151D978G12	325X	5.5	CLE-22
9F60GJC400②	151D978G13	400E	5.5	CLE-22
9F61AAB301	151D907G01	225	2.8	CLE③
9F61AAB305	432D140A02	225	2.8	CLE③
9F61AAB401	151D909G01	450	2.8	CLE③
9F61AAB405	116D412A02	450	2.8	CLE③
9F61ABG101	676C236A02	1.5	8.3	CLE③
9F61ADG101	676C236A04	1.5	15.5	CLE③
9F61ADJ101	676C236A05	1.5	15.5	CLE③

① GE's fuse is double barrel.
② GE's fuse is double barrel and is only rated 4.16 KV.
③ Mounting Only.
④ GE's fuse is indoor or outdoor – Ⓦ fuse is indoor only.

Further Information

Price List 36-711
Application Data 36-686
Technical Certification Section 36-712A
Performance Curves: Application Data 36-715

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