

Fuse Links

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Warranty - Application

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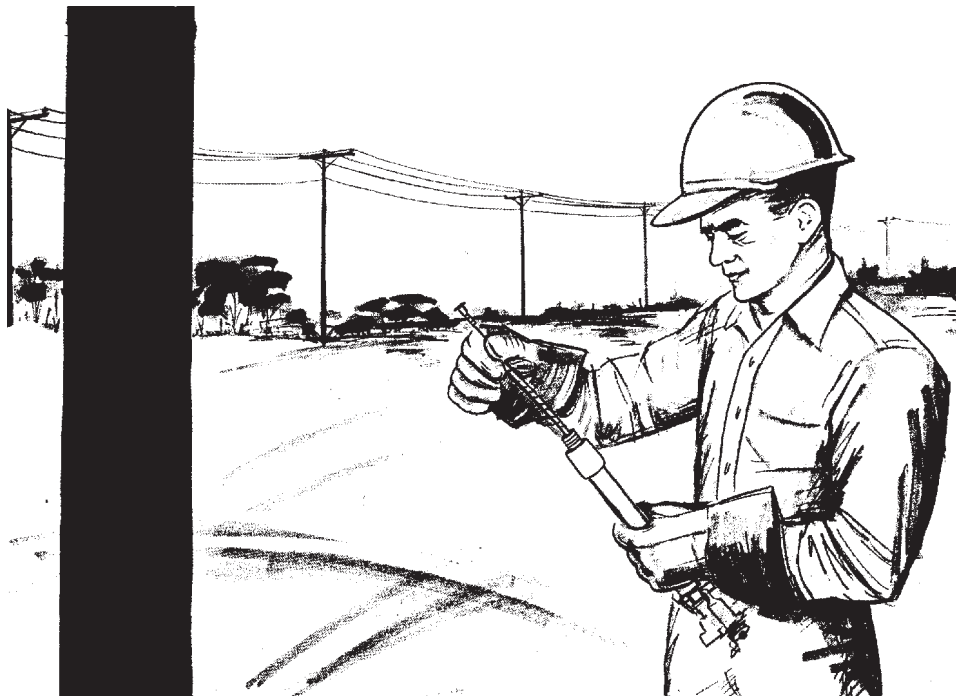
Responsibility for selection of the proper product or application rests solely with the purchaser. In the event of errors or inaccuracies determined to be caused by Hubbell Power Systems, Inc., its liability will be limited to the re-performance of any such analysis or study.

WARNING

These fuse links will not protect personnel from electrocution. Hot gases and high velocity particles are expelled during interruption. This expulsion can cause serious injury. Do not get in line with fuseholder. Stay away from conical space below fuseholder.

CAUTION: The equipment covered in this catalog section should be installed, used, and serviced only by competent personnel familiar with and following good work and safety practices. This equipment is for use by such personnel and is not intended as a substitute for adequate training and experience in safe procedures for this type of equipment.

This catalog information and any related instruction sheets do not cover all details or situations in equipment use nor do they provide for every possible contingency to be encountered in relation to installation, operation or maintenance. Should additional information and details be desired, or if specific situations arise which are not covered adequately for the user's purpose, the specifics should be referred to Hubbell Power Systems, Inc.



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Fuse Links

- TYPE K
- TYPE MS

- TYPE T
- SLOFAST



- **Meet all applicable ANSI/NEMA standards**

Chance Type K and Type T fuse links are made in complete accordance with ANSI/NEMA standards. Other Chance links meet all the standards except those covering time-current characteristics. Time-current characteristics for links other than K and T links are not covered in the ANSI standards.

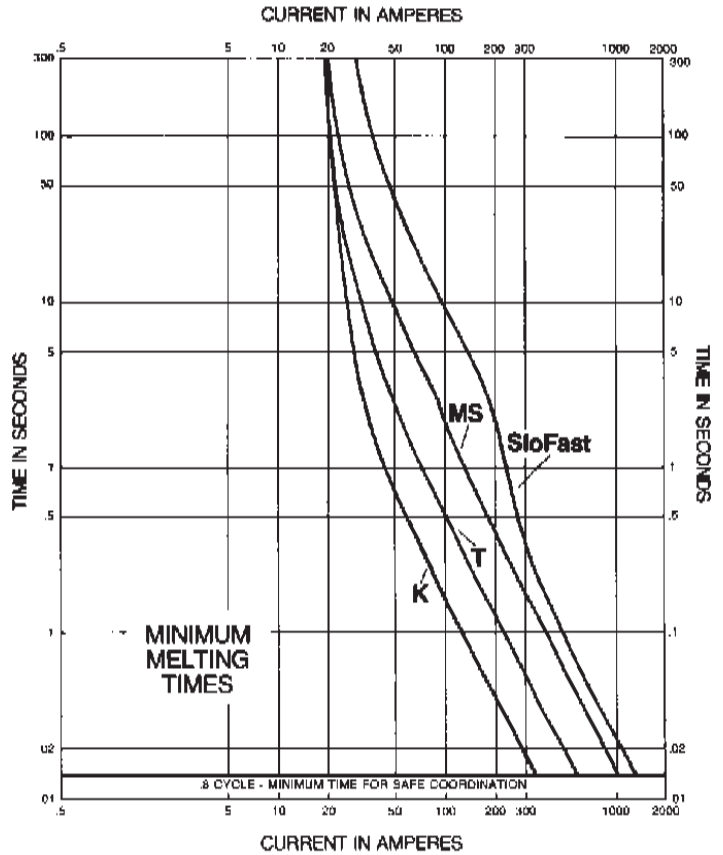
- **Precision — The standard of Chance fuse links**

Chance fuse links assure system protection because they are precision manufactured. The fusible materials used in Chance Fuse Links are under continual control during manufacture. Pre-tested to guarantee their electrical values, these materials are held to precise tolerances. At critical points during the manufacturing process, rigid inspections are made.

Packaging

Chance fuse links come in protective plastic bags with perforations to facilitate quick, easy opening even when lineman's gloves are worn. Each bag remains completely sealed for all-weather protection and keeps the links protected in the line truck's bins.

Type and amperage is printed on each bag, for easy identification.



RELATIVE SPEEDS OF CHANCE FUSE LINKS

Format: 10 Ampere Links (10.4 amp. SloFast)



Type K fuse links

Application

The fast characteristics of Type K fuse links were established by ANSI/NEMA to provide fuse links that would meet existing coordination schemes.

Chance Type fuse links are designed to carry 150% of their rated current without damage to the fuse link itself or the cutout in which it is installed. This capacity is for special loading situations, such as short-time overloads and cold load pick-up.

Buttonheads and lengths

Conforming to all applicable ANSI/NEMA specifications, Chance Type K links are available with a removable or solid buttonhead.

Note: Catalog Numbers shown are 23" overall length; also available in 26" length.

For 26": *Solid head K or T links, change the last two digits from 23 to 26.

†Removable head K or T links, drop the last two digits.

Materials used

The fusible section of the 1 through 3 ampere Type K links consist of a stainless-steel fuse strain wire; the 6 through 10 ampere, stainless-steel strain wire and a copper-alloy fuse wire; 12 through 100 amperes, a stainless steel strain wire and a silver-copper fuse wire; 140 and 200 ampere, a silver-copper fuse wire large enough to serve as both strain and fuse wire.

Amps	Catalog Number	
	*Solid head	†Removable head
1	M1K23	M1KA23
2	M2K23	M2KA23
3	M3K23	M3KA23
6	M6K23	M6KA23
8	M8K23	M8KA23
10	M10K23	M10KA23
12	M12K23	M12KA23
15	M15K23	M15KA23
20	M20K23	M20KA23
25	M25K23	M25KA23
30	M30K23	M30KA23
40	M40K23	M40KA23
50	M50K23	M50KA23
65	M65K23	M65KA23
80	M80K23	M80KA23
100	M100K23	M100KA23
140	M140K23	M140KA23
200	M200K23	M200KA23

Twin Pigtail Type K and T fuse links

The twin pigtail fuse link is convenient to work with and easier to install in the cutout than conventional single pigtail fuse links. The pigtails attach under the clamp with one on each side of the attachment stud.

*Catalog Numbers shown are 23" in overall length; for 26", see Note above.

Twin Pigtail fuse links

Type	Amps	*Solid head	†Removable head
K	200	M200K23T	M200KA23T
T	200	M200T23T	M200TA23T
K	140	M140K23T	M140KA23T
T	140	M140T23T	M140TA23T

Type T fuse links

Application

Chance Type T fuse links provide slower time-current characteristics than the Type K links. Type T links coordinate particularly well with automatic oil-circuit reclosers.

Chance Type T links are designed to carry 150% of their rated current without damage to the fuse link itself or the cutout in which it is installed. This capacity is for special loading situations, such as, short-time overloads, and cold-load pick-up.

Fuse elements

1 through 3 ampere Type T fuse links employ a fusing section consisting of a stainless-steel wire serving as both strain and fuse wire; 6 through 100 ampere, a stainless-steel strain wire and

a pure-tin fuse wire in parallel. 140 and 200 ampere T links have a copper element mechanically crimped at one end, soldered at the other end. On overloads or low faults, the solder becomes a fluid and the link separates; on higher fault currents, the link separates when the copper wire melts.

Buttonheads and lengths

Chance Type T fuse links meet all applicable ANSI/NEMA specifications. They are available with a removable or solid buttonhead.

*†Catalog Numbers shown are 23" in overall length; for 26", see Note above.

Amps	Catalog Number	
	*Solid head	†Removable head
1	M1T23	M1TA23
2	M2T23	M2TA23
3	M3T23	M3TA23
6	M6T23	M6TA23
8	M8T23	M8TA23
10	M10T23	M10TA23
12	M12T23	M12TA23
15	M15T23	M15TA23
20	M20T23	M20TA23
25	M25T23	M25TA23
30	M30T23	M30TA23
40	M40T23	M40TA23
50	M50T23	M50TA23
65	M65T23	M65TA23
80	M80T23	M80TA23
100	M100T23	M100TA23
140	M140T23	M140TA23
200	M200T23	M200TA23

Type MS fuse links (Equivalent to Kearney Type KS)

Application data

Chance Type MS fuse links have very slow time-current characteristics. In applications where ANSI/NEMA Type T fuse link characteristics are too-fast, the slower characteristics of Type MS can often be utilized.

Fuse-section operation

The fuse element of Chance Type MS fuse links is composed of two copper or copper-alloy wires joined by a solder junction. During heavy overloads or low fault currents, the heat generated by the two wires melts the solder, causing fuse operation. Operation under medium or heavy fault current occurs as one of the two wires melt.

Buttonhead and lengths

The Type MS link is available with only a removable buttonhead.

***Note:** Catalog Numbers shown are 23" overall length; also available in 26" length.

†For 26", drop the last two digits.

Amps	*Catalog Number
	Removable head
3	M3MSA23
5	M5MSA23
7	M7MSA23
10	M10MSA23
15	M15MSA23
20	M20MSA23
25	M25MSA23
30	M30MSA23
40	M40MSA23
50	M50MSA23
65	M65MSA23
80	M80MSA23
100	M100MSA23
125	M125MSA23
150	M150MSA23
200	M200MSA23

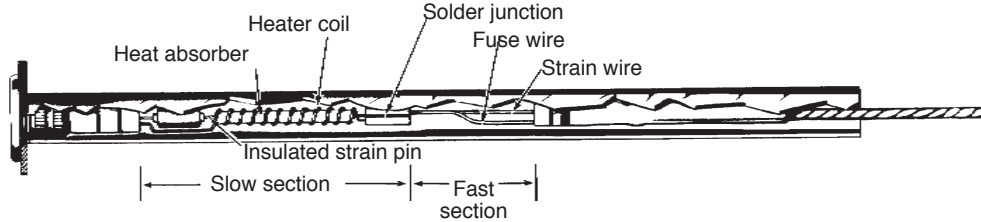
SloFast fuse links

Transformer protection

Secondary temporary faults that can be withstood by a transformer will not rupture a SloFast fuse link. If secondary faults persist and become dangerous, the SloFast link will operate, preventing damage to the transformer.

System protection

When a heavy fault occurs within the transformer primary bushings, a SloFast link clears the transformer from the system before damage can occur, and before any other protective device can operate and cause an unnecessary interruption to any other segment of the system.



Construction and theory of operation

The inner construction of the SloFast Fuse Link is illustrated in the cut-away view above. There are two distinct current-responsive elements: one slow, one fast.

The slow current-responsive element is made up of a number of components. The heater coil and the soldered junction are the two primary components. The insulated strain pin serves to carry the tension exerted when the fuse link is installed in a fuse cutout, and as a heat conductor to the soldered junction. The ceramic tube serves as a heat absorber.

The slow current-responsive element functions in the following manner: The heater coil generates heat at a rate which is proportional to the square of the current. This heat is absorbed by the ceramic material and transmitted to the soldered junction via the metallic strain pin. When a certain

value of current flows for a specific length of time, sufficient heat is generated and transmitted to the soldered junction to cause melting of the solder, and the separation of the fuse link, and the interruption of the circuit. The time-current curve of the slow current-responsive element is that portion above the "knee" (4 seconds to 5 minutes on the time axis) in the graph below.

The fast current-responsive element is constructed like the single element in a conventional fuse link. Operation of the fuse link in time periods of less than 4 seconds is conventional. The time-current curve of the fast current-responsive element is that portion below the "knee" in the time-current graph below.

Application data

A comparison of the time-current curves of the Chance SloFast fuse link with those of conventional fuse links and the safe-loading time current characteristics for distribution transformers illustrates the application potential of the SloFast fuse links.

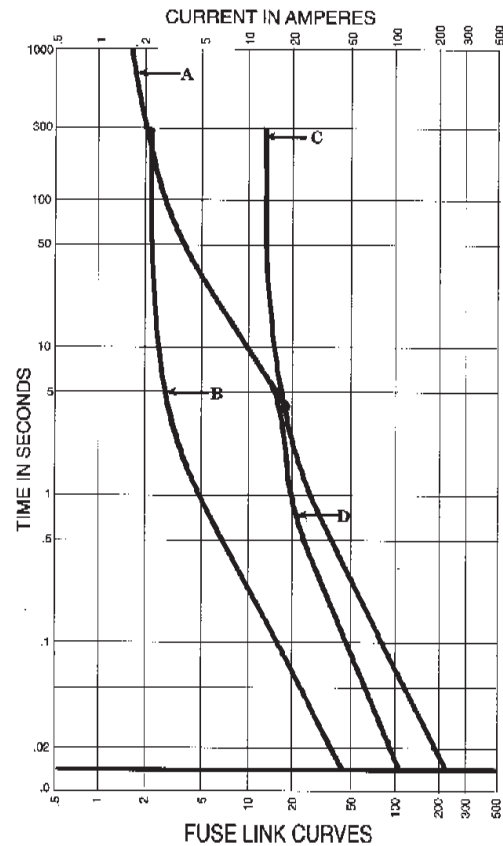
The rather unusual current rating assigned to SloFast fuse links is an aid in their application since the current rating assigned is identical to the continuous current rating of the transformers which they were specifically designed to protect.

If the SloFast link is used in place of ordinary links, the full overload capacity of the transformer is made available, but at the same time the transformer is protected from faults and overloads which could either destroy or shorten its life expectancy.

SloFast is the perfect match for transformer protection. **Note:** For application of SloFast links for transformers, see Bulletin 10-8010.

Amps	Catalog Number	
	Solid head	Removable head
0.4	M0D4SF23	M0D4SFA23
0.6	M0D6SF23	M0D6SFA23
0.7	M0D7SF23	M0D7SFA23
1.0	M1D0SF23	M1D0SFA23
1.3	M1D3SF23	M1D3SFA23
1.4	M1D4SF23	M1D4SFA23
1.6	M1D6SF23	M1D6SFA23
2.1	M2D1SF23	M2D1SFA23
3.1	M3D1SF23	M3D1SFA23
3.5	M3D5SF23	M3D5SFA23
4.2	M4D2SF23	M4D2SFA23
5.2	M5D2SF23	M5D2SFA23
6.3	M6D3SF23	M6.3SFA23
7.0	M7D0SF23	M7D0SFA23
7.8	M7D8SF23	M7D8SFA23
10.4	M10D4SF23	M10D4SFA23
14	M14SF23	M14SFA23
21	M21SF23	M21SFA23
32	M32SF23	M32SFA23
46	M46SF23	M46SFA23

Note: Catalog Numbers shown are 23" overall length; also available in 26" length. For 26" links, drop the last two digits.



- Curve A Safe Loading Curve for 5kVA 7200 V. Transformer
- Curve B Average Melting Curve for NEMA 1 Amp. K
- Curve C Average Melting Curve for NEMA 6 Amp. K
- Curve D Average Melting Curve for .7 Amp. SloFast Fuse Link