

## Introduction

### Worldwide circuit protection solutions

Eaton is the world-leading supplier of Bussmann series medium voltage fuses. Each product is backed by an efficient worldwide distribution network with unrivaled service and technical support. Eaton circuit protection solutions comply with major international standards: ANSI, BS, DIN, IEC and UL.

### Fuse types

Medium voltage fuses generally fit into two categories – expulsion fuses and current limiting. The definitions per ANSI C37.40 are:

**Expulsion fuse:** A vented fuse in which the expulsion effect of the gases produced by internal arcing, either alone or aided by other mechanisms results in current interruption. Expulsion fuses will limit the duration of an overcurrent event, but they will not limit the magnitude of fault current.

**Current-limiting fuse:** A fuse unit that, when in its current-responsive element is melted by a current within the fuse's specified current-limiting range, abruptly introduces a high resistance to reduce current magnitude and duration, resulting in subsequent current interruption. A current limiting fuse will reduce the magnitude a fault current as well as limit the duration of the overcurrent event when operating in its current limiting range. Eaton offers a broad range of current limiting fuses for protection of feeders, transformers and motor circuits designed to ANSI, BS, DIN and IEC standards.

### Medium voltage current-limiting fuses

Current-limiting fuses are classified into three categories:

1. **Full range** – defined by ANSI C37.40 as “a fuse capable of interrupting all currents from the maximum rated interrupting current down to the minimum continuous current that causes the melting of the fusible element(s), when the fuse is applied at the maximum ambient temperature specified by the manufacturer.” It is able to interrupt any current that will melt its element.
2. **General purpose** – defined by ANSI C37.40 as “a fuse capable of interrupting all currents from the maximum rated interrupting current down to the current that causes melting of the fusible element(s) in one hour.” Not all currents fall within this range. It is possible for the fuse to be exposed to an overcurrent lower than the value given by the one hour criteria. In that case, a different overcurrent protection device would be required to interrupt the overcurrent.
3. **Back-up** – defined by ANSI C37.40 as “a fuse capable of interrupting all currents from the maximum interrupting rating current down to the minimum interrupting current.” The minimum interrupting current is the lowest current that the fuse will be able to clear properly. This creates a need to place a low current interrupting device, such as motor overloads, in series with the back-up rated fuse.

## E- and R-Rated fuses

In North America, current limiting fuses typically fall into the category of E-Rated fuses and R-Rated fuses. Eaton also offers a wide range of Bussmann series current limiting fuses designed to BS, DIN and IEC standards.

E-Rated fuses are used to protect feeder circuits, power transformers and potential transformers. E-Rated fuses have defined current response times specified by ANSI C37.46. E-Rated fuses 100 amps and below must melt in 300 seconds at an RMS current within the range of 200 to 240 percent of the continuous current rating. E-Rated fuses above 100 amps must melt in 600 seconds at an RMS current within the range of 220 to 264 percent of the continuous current rating of the fuse. Eaton offers a wide variety of full range and general purpose E-Rated fuses from 2.4 to 38 kV.

R-Rated fuses are back-up fuses that provide short-circuit protection for motor circuits. They are applied with medium voltage motor starters which provide the overload protection for the circuit. R-Rated fuses also have defined current response times specified by ANSI C37.46. R-Rated fuses will melt in a range of 15 to 35 seconds at a current equal to 100 times the “R” rating. Bussmann series R-Rated fuses for motor circuit protection are available in voltage ratings from 2.4 to 8.3 kV.

**FL — Type H, and EEI-NEMA Type K and T fuses**

Medium voltage fuses: Type H (high surge), EEI-NEMA Type K (fast-acting), EEI-NEMA Type T (time-delay).

High-surge, Type H fuses are manufactured in ratings of 1, 2, 3, 5, and 8 amps and were developed for primary fusing of small-sized transformers. Type H links are manufactured in the universal button head design.

Type N fuses conform to previous NEMA standards and are superseded by Type K and T links. Type N fuses are manufactured in the universal button design in ratings of 5 through 200 amps for use in standard NEMA dimensioned cutouts rated through 27 kV.

**Ratings\***

- Volts rated to 27 kV
- Amps 1-200 A

\* See catalog number table for type and amp combinations.

**Features**

- Wide range of EEI-NEMA type fuse links for use in open fuse cutouts
- Voltage rating up to 27 kV for flexible application
- Can be coordinated with other overcurrent protective devices for sectionalizing to isolate feeder branches

**Typical applications**

- Medium voltage fused cutouts

**Type K universal silver-element cutout fuses rated to 27 kV**

Catalog no.	
Fast-acting EEI-NEMA Type K	Amps
<b>Non-removable button-head for standard open or enclosed cutouts</b>	
FL12K8	8
FL12K10	10
FL12K12	12
FL12K15	15
FL12K25	25
FL12K50	50

**Type H (high-surge), K and T universal tin element cutout fuses rated to 27 kV**

Catalog no.			
EEI-NEMA			
Type H high surge	Type K fast-acting	Type T time-delay	Amps
<b>Non-removable button-head for standard open or enclosed cutouts</b>			
FL11H1	FL11K1	FL11T1	1
FL11H2	FL11K2	FL11T2	2
FL11H3	FL11K3	FL11T3	3
FL11H5	FL11K5	FL11T5	5
—	FL11K6	FL11T6	6
FL11H8	FL11K8	FL11T8	8
—	FL11K10	FL11T10	10
—	FL11K12	FL11T12	12
—	FL11K15	FL11T15	15
—	FL11K20	FL11T20	20
—	FL11K25	FL11T25	25
—	FL11K30	FL11T30	30
—	FL11K40	FL11T40	40
—	FL11K50	FL11T50	50
—	FL11K65	FL11T65	65
—	FL11K80	FL11T80	80
—	FL11K100	FL11T100	100
—	FL11K140	FL11T140	140
—	FL11K200	FL11T200	200
<b>Removable button-head for cutouts requiring removable-button links*</b>			
—	FL3K1	FL3T1	1
—	FL3K2	FL3T2	2
—	FL3K3	FL3T3	3
—	FL3K5	FL3T5	5
—	FL3K6	FL3T6	6
—	FL3K8	FL3T8	8
—	FL3K10	FL3T10	10
—	FL3K12	FL3T12	12
—	FL3K15	FL3T15	15
—	FL3K20	FL3T20	20
—	FL3K25	FL3T25	25
—	FL3K30	FL3T30	30
—	FL3K40	FL3T40	40
—	FL3K50	FL3T50	50
—	FL3K65	FL3T65	65
—	FL3K80	FL3T80	80
—	FL3K100	FL3T100	100
—	FL3K140	FL3T140	140
—	FL3K200	FL3T200	200

\* Adapter-type removable-button links with ferrule adapter to convert to double-leader links are available in K and T types. Order by description.