



[fuses glossary of terms]

LOW VOLTAGE FUSES

"a" Fuselink (formerly Back-Up Fuselink)

A current limiting fuselink capable of breaking under specified conditions all currents between the lowest current indicated on its operating time-current characteristic and its rated breaking capacity.

Ambient Air Temperature (T_a)

The ambient air temperature is that of the air surrounding the fuse (at a distance of about 1 m from the fuse or its enclosure, if any).

Arcing Time

The arcing time is the interval of time between the instant of the initiation of the arc and the instant of final arc extinction.

Breaking Capacity

The breaking capacity is the highest value (for a.c. the r.m.s. value of the a.c. component) of prospective current that a fuselink is capable of breaking at a stated voltage under prescribed conditions of use and behaviour.

Breaking Range

Breaking range is a range of prospective currents within which the breaking capacity of a fuselink is assured.

Conventional Non-Fusing Current (I_{nf})

A value of current specified as that which the fuselink is capable of carrying for a specified time (conventional time) without melting. The conventional time relates to the thermal time constant of the fuselink and varies between 1 and 4 hours depending on the current rating.

Conventional Fusing Current (I_f)

A value of current specified as that which causes operation of the fuselink within a specified time (conventional time). The conventional time relates to the thermal time constant of the fuselink and varies between 1 and 4 hours depending on the current rating.

Current-Limiting Fuselink

A current-limiting fuse link limits the current to a substantially lower value than the peak value of the prospective current during and by its operation in a specified current range.

Cut-Off Current

The cut-off or let-through current is the maximum instantaneous value reached by the current during the breaking operation of a fuselink when it operates in such a manner as to prevent the current from reaching the otherwise attainable maximum.

Cut-off (current) characteristic

The cut-off (current) characteristic or let-through current characteristic is a curve giving the cut-off current as a function of the prospective current, under stated conditions of operation.

Dissipated Power

When a current passes through a fuse link, a small amount of energy is dissipated due to the fuse links resistance.

Fault current

A current resulting from a fault, a circuit condition in which the current flows through an abnormal, unintended path. This can be for example insulation fault. If there were no protection device safely opening the electrical circuit heavy damage to the system would occur.

Fusing factor

The fusing factor is the ratio, greater than unity, of the minimum fusing current to the current rating.

Fuse

A fuse is a device that by the fusing of one or more of its specially designed and proportioned components, opens the circuit in which it is inserted by breaking the current when this exceeds a given value for a sufficient time. The fuse comprises all the parts that form the complete device mainly fuse link and fuse base.

Note! It is common practice to refer to a "fuselink" as a "fuse".

Fuseholder

The fuseholder is the combination of the fuse base with its fuse carrier.

Fuse Base (Fuse Mount)

This is the fixed part of a fuse provided with contacts, terminals and covers, where applicable.

Fuse Carrier

This is the movable part of a fuse designed to carry a fuselink.

Fuselink (Cartridge Fuselink)

The fuselink is the part of a fuse including the fuse element(s), intended to be replaced after the fuse has operated.

Note! It is common practice to refer to a "fuselink" as a "fuse".

Fuses for use by Unskilled Persons

Fuses intended to be used in installations where the fuselinks are accessible to and can be replaced by unskilled persons.

Fuses for Use by Authorised Persons

Fuses intended to be used in installations where the fuselinks are accessible or intended to be replaced by authorised persons only.

Fuse Contact

The fuse contact consists of two or more conductive parts designed to ensure circuit continuity between a fuselink and the corresponding fuseholder.

Fuse Element

A fuse element is a part of a fuselink designed to melt when the fuse operates. The fuselink may comprise several fuse elements in parallel.

"g" Fuselink (formerly General Purpose fuselink)

A "g" fuselink is a current-limiting fuselink capable of breaking under specified conditions all currents which cause melting of the fuse element up to its rated breaking capacity.

Gate

Limiting values within which the characteristics, for example time-current characteristics, shall be contained.

Homogeneous Series of Fuselinks

A series of fuselinks, within a given size.

I²t (Joule Integral)

See Joule integral.

I²t Characteristic

A curve giving I²t values (pre-arcing I²t and/or operating I²t) as a function of prospective current under stated conditions of operation.

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Indicating Device (Indicator)

A device provided to indicate whether the fuse has operated.

Joule integral

The I^2t or Joule integral is a measure of the thermal stress or thermal energy let through by the fuse during short circuit interruption. It is the integral of the square of the current over a given time and is expressed in ampere square seconds.

Two values of I^2t are provided for MV-fuse links:

- Pre arcing or melting I^2t – for high short circuit currents – this is practically a constant value.
- Operation I^2t – this varies with circuit conditions.

Let-through current

The cut-off or let-through current is the maximum instantaneous value of current attained during the breaking operation of a MV-fuse link. This is of particular importance when the MV-fuse link operates in such a manner that the prospective peak current of the circuit is not reached.

Let-through current characteristic

The cut-off (current) characteristic or let-through current characteristic is a curve giving the cut-off current as a function of the prospective current, under stated conditions of operation.

Melting time

The pre-arcing time or melting time is the interval of time between the beginning of a current large enough to cause a break in the fuse element(s) and the instant when an arc is initiated.

Minimum breaking current

The minimum breaking current is a minimum value of prospective current that an MV-fuse link of Back-Up or General Purpose characteristic is capable of breaking at a stated voltage under prescribed conditions of use and behaviour.

MV-Back-Up fuse

A MV-Back-Up fuse is a current limiting fuse capable of breaking all currents from the rated maximum breaking current down to the rated minimum breaking current.

MV-Full Range fuse

A MV-Full Range fuse is a current limiting fuse capable of breaking all currents that cause melting of the fuse-element(s), up to its rated

breaking current.

MV-General Purpose fuse

A MV-General Purpose fuse is a current limiting fuse capable of breaking all currents from the rated maximum breaking current down to the current that causes melting of the fuse-element(s) in 1 h or more.

MV-fuse element

A MV-fuse element is a part of the MV-fuse link designed to melt under the action of current exceeding some definite value for a definite period of time.

MV-fuse link

An MV-fuse link is the part of the MV-fuse (including the fuse-element(s)) intended to be replaced after the MV-fuse has operated.

Non-interchangeable

Limitations on shape and/or dimensions with the object of avoiding in a specific fuse base the inadvertent use of fuselinks having electrical characteristics other than those ensuring the desired degree of protection.

Operating time

The operating time or total clearing time is the sum of the pre arcing time and the arcing time.

Overcurrent Discrimination

Co-ordination of the relevant characteristics of two or more overcurrent protective devices such that, on the occurrence of overcurrents within stated limits, the device intended to operate within these limits does so, while the other(s) do(es) not.

Overcurrent

An overcurrent is a current exceeding the rated current. An overcurrent can be an overload current, fault current or short circuit current.

Overload current

A current resulting from an overload occurring in a normally working electrically circuit, for example an overloaded motor. If there is no protective device operating in a limited time – e.g. several seconds – the electrical system would get overheated and e.g. cable isolation would melt and cause damage.

Overload Curve of an "A" Fuselink

A curve showing the time for which an "A" fuselink shall be able to carry the current without deterioration.

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Peak Withstand Current (of a fuseholder)

The value of cut-off current that the fuseholder can withstand.

Power Dissipation

The power dissipation is the power released in a fuse link carrying a stated value of current under prescribed conditions of use and behaviour, usually including a constant r.m.s. value of current until steady temperature conditions are reached.

Pre-Arcing Time

The pre-arcing time or melting time is the interval of time between the beginning of a current large enough to cause a break in the fuse element(s) and the instant when an arc is initiated.

Prospective Current of a Circuit (With respect to a fuse.)

The prospective current is the current that would flow in a circuit if a fuse situated therein were replaced by a link of negligible impedance. The prospective current is the quantity to which the breaking capacity and characteristics of the fuse are normally referred, e.g. I_2t and cut-off current characteristic.

Prospective Short Circuit Current

The prospective short circuit current is the value of the current that would flow if there was no protection in the circuit. The lower the power factor of the installation, the higher the peak value of this destructive current.

Rating

A general term employed to designate the characteristic values that together define the working conditions upon which the tests are based and for which the equipment is designed.

Rated Current of a Fuselink (In)

A value of current that the fuselink can carry continuously without deterioration under specified conditions.

Rated Frequency

The rated frequency is the frequency for which the MV-fuse link has been designed and to which the values of the other characteristics correspond. Standard values of rated frequency are 50 Hz and 60 Hz.

Rated Insulation Level

The rated insulation level (of a MV-fuse base) is the voltage values (both

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power-frequency and impulse) which characterize the insulation of the fuse base with regards to its capability of withstanding the dielectric stresses. The rated insulation level of a MV-fuse base should be selected from tables 4 and 5 of IEC 60282-1.

It shall be stated whether the MV-fuse is suitable for indoor or outdoor service.

Rated Values

Rated values usually stated for HV-fuse links are

- Voltage
- Current
- Breaking capacity
- Frequency

They are generally assigned by a manufacturer for specified operation conditions.

Rated Voltage

The Rated voltage, U_n , is the maximum value of voltage at which an fuse link can be used, and safely interrupt an overcurrent. This rated voltage must be higher or equal to the highest voltage of the system in which the MV-fuse link shall be installed.

Recovery Voltage

The recovery voltage is the voltage, which appears across the terminals of a fuse after the breaking of the current. This voltage may be considered in two successive intervals of time, one during which a transient voltage exists, followed by a second one during which the power frequency or the steady-state recovery voltage alone exists.

Short Circuit

A high value of overcurrent resulting from a fault of negligible impedance between conductors with difference potential and under normal operating conditions. A short circuit current can be many hundreds or even thousands of times larger normal load current. The protective device has to operate in no more than a few milliseconds if the risk of damage and destruction is to be avoided.

Striker

A striker is a mechanical device forming part of an fuselink which, when the fuse operates, releases the energy required to cause operation of other apparatus or indicators or to provide interlocking.

Switching voltage

The switching voltage is the maximum instantaneous value of voltage, which appears across the terminals of a fuse during its operation. Under

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short circuit conditions this will often exceed the peak system voltage for a period of time..

Time-current characteristic

The time-current characteristic is a curve giving the time, for example pre-arcing time, as a function of the prospective current under stated conditions of the operation.

The time-current curve is used to achieve co-ordination with the other fuses or devices in the same installation.

Total clearing time

The operating time or total clearing time is the sum of the pre arcing time and the arcing time.

Terminal

A conductive part of a fuse provided for electric connection to external circuits.

Time-Current Characteristics

A curve giving the pre-arcing time or operating time as a function of the prospective current under stated conditions of operation.

Utilisation Category (of a fuselink)

A combination of specified requirements related to the conditions in which the fuselink fulfils its purpose, selected to represent a characteristic group of practical applications. It is usually represented by a letter which is preceded by a letter representing the breaking range:-

gG — full range breaking capacity for general application.

gM — full range breaking capacity for the protection of motor circuits.

gR — full range breaking capacity for the protection of semiconductor devices.

aM — partial range breaking capacity for the protection of motor circuits.

aR — partial range breaking capacity for the protection of semiconductor devices.

Virtual time

The virtual time is the value of Joule integral divided by the square of the value of the prospective current. Usually stated for a MV-fuse link are the values of pre-arcing time and of operating time.

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