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Fuse Links, Thermal Circuit Breakers

General Information

Fuse links are self-acting break appliances for the protection of electrical devices against unsuitable current loads. The current flow is interrupted by the melting of the fuse wire in which the current flows.

The following international regulations and recommendations in their currently valid version are valid for fuse links.

- DIN 72581 - DIN 43560 - ISO 8820 - UL 275 - SAE
(Further the level of technology, the details of the actually valid implementation provisions, the safety-principle "human beings, animals and material assets must be protected against danger," as well as the qualification of the installed components should be taken into account - self-responsibility of the manufacturer of electrical devices.)

Polyfuse® PTCs are actually positive polymeric temperature coefficient (PPTC) devices consisting of conductive carbon black particles. Under normal operating conditions, strings of carbon particles conduct current while exhibiting a very low internal resistance. When the Polyfuse PTC's trip or fault current is exceeded, the particle strings break up and disburse randomly followed by a rise in internal component resistance of several orders of magnitude. This rapid increase in resistance limits current flow to nearly zero effectively protecting the downstream circuitry. When the fault subsides or power is removed, the Polyfuse PTC cools and resets returning to its pre-tripped state.

The basic components of a thermal circuit breaker are the thermal alloy element (bimetal), electrical contacts, and the terminals for external connections. When an overload occurs, heat is generated as the current flows through the thermal alloy element causing it to deflect and separate the electrical contacts, interrupting current flow.

An important parameter used to judge the performance of a thermal circuit breaker is the time-versus-current characteristic curve, which is similar to that of a fuse. A thermal circuit breaker is generally not a one-event type device as is a fuse. The resettable features of circuit breakers are often found attractive for use in electrical circuits where non-resetting interruption of current flow is undesirable.

It is important to note that cycle life of a thermal circuit breaker is impacted both by the operational characteristic of the circuit breaker as well as the relative magnitude and duration of overcurrents or short circuits that the device experiences.

SAE-Types of thermal Circuit Breakers

In contrast to fuse links, thermal Circuit Breakers are resettable. There are SAE definitions for the different types of thermal circuit breakers, which are described below. Four different reset operational methods are generally available:

- **Type I (automatic reset):** the circuit breaker trips and resets in response to the overcurrent condition in a repetitive fashion. **This version shall be used in applications that provide for other self-limiting or non-resettable means (such as after a main fuse, main manual-reset circuit breaker, or momentary switch). These devices, while automatic in reset function, are not designed for long-term cycling conditions in applications where operator awareness of circuit fault or serviceability access is limited, leading to undesirable problems.** Refer to SAE J553 or J1625 for additional details.
- **Type II (modified reset):** the circuit breaker contains an additional resistive component that causes the tripped bimetal element to remain open. The open circuit condition is maintained (except for a low milliamp draw through the resistor) until the entire thermal circuit breaker is re-energized. Requires minimum voltage/current to maintain open circuit – see standards for details.
- **Type III (manual reset):** the circuit breaker will trip in response to an overcurrent condition after which a reset button or lever extends externally to indicate that the breaker has tripped and is in a non-conducting status. The trip indicator button or lever must be manually activated to return the device to normal operation.
- **Type III* (switchable):** same as the Type III manual reset with the additional feature that allows the user to open the circuit using an externally accessible trip mechanism.

Regarding the layout of thermal circuit breakers, it is required that the application provides enough current for operating the circuit breaker in the event of a failure. Otherwise it is possible that it fails to trip, and the failure in the circuit may persist. This applies in particular to applications that are incapable of providing enough fault current for activating the circuit breaker.

Sicherungen, thermische Überstromschutzschalter

Allgemeines

Sicherungen sind selbsttätig wirkende Unterbrechungs- vorrichtungen zum Schutz von elektrischen Anwendungen gegen Strombelastungen unzulässiger Stärke und Dauer, bei denen der Stromfluß durch Abschmelzen des vom Strom durchflossenen Schmelzleiters unterbrochen wird.

Für Sicherungen gelten folgende internationale Bestimmungen und Empfehlungen der jeweils gültigen Fassung:
 - DIN 72581 - DIN 43560 - ISO 8820 - UL 275 - SAE
 (Desweiteren sind der Stand der Technik, die Einzelheiten der jeweils gültigen Anwendungsvorschriften, der Sicherheitsgrundsatz "Menschen, Tiere und Sachwerte vor Gefahren zu schützen", sowie die Qualifikation der eingesetzten Bauelemente zu beachten - Eigenverantwortung des Herstellers elektrischer Betriebsmittel.)

Polyfuse® PTC's sind polymere Bauelemente mit einem positiven Temperaturkoeffizienten (PPTC). Unter normalen Betriebsbedingungen bilden leitfähige Partikel im Polymer niederohmige Strompfade. Wird der Auslösestrom der Polyfuse überschritten, heizt sich das Bauteil auf und die Strompfade brechen auseinander. Dabei steigt der Innenwiderstand rapide um mehrere Dekaden an und begrenzt den Strom auf einen sicheren Wert. Nach Beseitigung des Fehlers und Unterbrechen der Spannung kühlt die Polyfuse ab und die Strompfade rekombinieren sich selbstständig.

Die grundlegenden Komponenten eines Wärmeschutzschalters sind das Wärmeelement (Bi-Metall) aus legiertem Material, elektrische Kontakte und Anschlüsse für externe Verbindungen. Beim Auftreten eines Überstromes wird Wärme erzeugt. Der durch das Bi-Metall fließende Strom erzeugt eine Verlustleistung, die in Wärme umgesetzt wird. Diese erwärmt das Bi-Metall. Es verformt sich und trennt die elektrischen Kontakte. Der Stromfluss ist unterbrochen.

Ein wichtiger Parameter zur Beurteilung eines Wärmeschutzschalters ist die Zeit-Strom-Kennlinie, ähnlich der einer Sicherung. Ein thermischer Überstromschutzschalter ist gewöhnlich nicht nur für einen Auslösungsfall bestimmt. Da Sicherungsautomaten wieder anwendbar sind, gelten sie oft als günstig für den Einsatz in elektrischen Stromkreisen, wo eine nicht rückgängig zu machende Unterbrechung im Stromfluss unerwünscht ist.

Es muss unbedingt darauf hingewiesen werden, dass die Lebensdauer eines Wärmeschutzschalters sowohl durch die Betriebsmerkmale des Schutzschalters als auch durch die relative Größe und Dauer von Überströmen oder Kurzschlüssen bestimmt wird, denen die Vorrichtung ausgesetzt ist.

SAE-Typen der thermischen Überstromschutzschalter

Im Gegensatz zu Sicherungen sind Sicherungsautomaten rücksetzbar. Dazu gibt es von der SAE Definitionen zu unterschiedlichen Typen. Allgemein stehen vier verschiedene Rückstellverfahren zur Verfügung:

- **Typ I (automatische Rückstellung):** Der Schutzschalter wird als Reaktion auf die Überstrombedingung wiederholt ausgelöst und erneut zurückgestellt. **Diese Version ist bei Anwendungen für andere selbstbegrenzende oder nicht rückstellbare Vorrichtungen zu benutzen (beispielsweise nach einer Hauptsicherung, einem manuell rückstellbaren Schutzschalter oder Tastschalter). Diese Vorrichtungen sind, obwohl sie eine automatische Rückstellfunktion aufweisen, nicht für langanhaltende Wiederholungen bei Anwendungen bestimmt, wo die Wahrnehmungsmöglichkeit des Bedienpersonals bei einem Fehler im Stromkreis oder die Betriebsfähigkeit begrenzt ist, wodurch sich unerwünschte Probleme ergeben können.** Weitere Angaben dazu können SAE J553 oder J1625 entnommen werden.
- **Typ II (modifizierte Rückstellung):** Der Schutzschalter enthält eine zusätzliche Widerstandskomponente, durch welche die das ausgelöste Bi-Metall offen gehalten wird. Die geöffnete Stellung wird beibehalten (außer einem Strom im niedrigen Milliampere-Bereich über den Widerstand) bis der ganze thermische Schutzschalter wieder mit Energie beaufschlagt wird. Eine(r) minimale(r) Spannung/Strom ist erforderlich, um den Stromkreis offen zu halten - Einzelheiten dazu sind den Normen zu entnehmen.
- **Typ III (manuelle Rückstellung):** Der Schutzschalter wird ausgelöst auf Grund eines Überstroms, wonach ein Rückstellknopf oder -hebel heraus ragt um anzuzeigen, dass der Schutzschalter geöffnet hat und sich im nicht leitenden Zustand befindet. Der Knopf/Hebel zur Auslösungsanzeige muss manuell betätigt werden, damit der thermische Schutzschalter wieder in den normalen Betriebszustand zurückversetzt wird.
- **Typ III* (schaltbar):** ebenso wie Typ III - manuelle Rückstellung, mit zusätzlicher Funktion, die es dem Benutzer gestattet, den Stromkreis mit Hilfe eines extern zugänglichen Auslösemechanismus zu öffnen.

Für die Bemessung von thermischen Schutzschaltern ist es erforderlich, dass in einem Fehlerfall die Anwendung ausreichend Leistung dem Sicherungsautomaten zur Verfügung stellt. Andernfalls kann es zu einer unerwünschten "Nichtauslösung" kommen, in der dann der Fehler im Stromkreis bestehen bleibt. Dies gilt insbesondere für Anwendungen, die keinen ausreichenden Fehlerstrom bereitstellen können, um den Schutzschalter auslösen zu können.

Explanations, Recommendations / Begriffe, Anwendungshinweise

The rated voltage (U_N) of a fuse link has to be at least equal or higher than the operating voltage of the device or assembly unit which is to be protected with the fuse link. If the operating voltage is very low, the fuse link's natural resistance (voltage drop) must possibly be taken into consideration.

The voltage drop (U_N) is measured according to standards e.g. DIN, ISO, JASO, partially maximum values common for Littelfuse are stated as well.

The rated current (I_{rat}) of a fuse link should approximately correspond to the operating current of the device or assembly unit which is to be protected (in accordance with the ambient temperature and rated current-definition, which means the permitted continuous currents).

Higher ambient temperatures (T_{umg}) mean additional load for the fuse links. The heating conditions of the maximum occurring ambient temperature have to be checked, in particular with high rated currents of the fuses, and a strong thermal radiation of components nearby. For such applications, the fuse should be derated in accordance with the following diagram, resp. table (see factor F_T):

Due to different specifications of rated current the recommended continuous current of the fuse links is max. 80% of their rated current (with an ambient temperature of 23°C), see also the fuse-specific current-carrying capacity (F) on the individual pages of the catalog.

The pre-arcing time limits indicate the relation of fusing time to current. (They are presented as an envelope curve for all mentioned rated currents.)

The melting integral (I^2t) results from the squared melting current and the corresponding melting time. At excess current with melting times < 5 ms the melting integral remains constant. The data in this catalog are based on 6 or $10 \times I_{rat}$. The melting integral is an index for the time-current characteristic and informs about the pulse consistency of a fuse link. The mentioned melting integrals are typical values.

The breaking capacity (I_B) should be sufficient for any operating and error conditions. The short-circuit current (maximum fault current) to be interrupted by the fuse links at the rated voltage under default conditions must not be higher than the current corresponding to the breaking capacity of the fuse link.

The maximum power dissipation (P_V) is determined at a load with rated current, after having obtained temperature equilibrium. In operation, these values can occur for some time.

Typical values are indicated and in addition the standard values for fuses that comply with standards.

Die Nennspannung (U_N) der Sicherungen muß mindestens gleich oder größer als die Betriebsspannung der Anwendung oder der Baugruppe sein, für deren Schutz der Sicherungseinsatz bestimmt ist. Wenn die Betriebsspannung sehr niedrig ist, muß u.U. der Eigenwiderstand (Spannungsfall) der Sicherungen berücksichtigt werden.

Der Spannungsfall (U_D) - wird gemäß Normen, z.B. DIN, ISO, JASO ermittelt; zum Teil werden auch werkseigene Werte der Fa. Littelfuse als Maximal-Werte angegeben.

Der Nennstrom (I_N) soll etwa dem Betriebsstrom der zu schützenden Anwendung oder Baugruppe (unter Beachtung von Umgebungstemperatur definiertem Nennstrom, d.h. zulässigen Dauerströmen) entsprechen.

Höhere Umgebungstemperaturen bedeuten eine höhere Belastung der Sicherung. Bei solchen Anwendungsfällen ist deshalb die Korrektur (Derating) des Nennstromes entsprechend folgendem Diagramm bzw. Tabelle (siehe Faktor F_T) zu berücksichtigen:

Bedingt durch die unterschiedliche Definition des Nennstromes beträgt die empfohlene Dauerbelastbarkeit der Sicherungen max. 80% ihres Nennstromes ausgehend von einer Umgebungstemperatur von 23°C, siehe auch sicherungsspezifische Dauerbelastbarkeit (F) auf den einzelnen Katalogseiten.

Die Schmelz-Zeit-Grenzwerte geben die Abhängigkeit der Schmelzzeit vom Strom an. (Sie sind in Form von Hüllkurven für den gesamten angegebenen Strombereiche dargestellt.)

Das Schmelzintegral (I^2t) ergibt sich aus dem Produkt aus dem Quadrat des Schmelzstromes und der dazugehörigen Schmelzzeit. Bei hohen Überströmen mit Schmelzzeiten < 5 ms bleibt das Schmelzintegral konstant. Für die Angaben in dieser Liste wurden die Werte bei 6 bzw. $10 \times I_N$ verwendet. Das Schmelzintegral ist ein Kennzeichen für die Zeit-Strom-Charakteristik und ermöglicht z.B. eine Aussage über die „Pulsfestigkeit“ eines Sicherungseinsatzes. Die angegebenen Schmelzintegrale sind typische Werte.

Das (Aus-) Schaltvermögen (I_B) soll für alle Betriebs- und Fehlerbedingungen ausreichend sein. Der Kurzschlußstrom (max. auftretender Fehlerstrom), den der Sicherungseinsatz bei seiner Nennspannung unter vorgegebenen Bedingungen unterbrechen soll, darf nicht höher sein als der Strom, der dem Schaltvermögen der Sicherung entspricht.

Die maximale Verlustleistung (P_V) wird bei einer Belastung mit dem Nennstrom nach Erreichen des Temperaturgleichgewichts ermittelt. Diese Werte können im praktischen Betrieb für eine längere Zeit auftreten.

Angegeben werden typische Werte und bei Sicherungen nach Norm zusätzlich die Normwerte.

Quality Control / Qualitätssicherung

For the production of high-quality fuse links, a good knowledge of and a long experience in the field of these components are a prerequisite. Quality control starts with the correct selection of design, materials, type of manufacturing, manufacturing procedures, etc., in order to fulfil the pre-defined requirements. All relevant characteristics of the components are included in quality control.

Our target for quality is 100% product quality.

Quality control in detail:

The quality control system is based on the international standard DIN EN ISO 9001:2000, tailored to the specific requirements for protective elements and tested by independent certification centers.

Certification was carried out in accordance with:

- ISO/TS 16949:2002
- DIN EN ISO 9001:2000
- DIN EN ISO 14001

Certification is confirmed every year by a repeated audit carried out by the certifying authority.

The purchased parts are checked in the goods inward inspection according to the spot check system in accordance with IEC 410 (DIN ISO 2859 T1, MIL-STD 105 D). The other individual parts and assemblies produced in our company are checked in the same way. In production, corresponding manufacturing production controls are inserted in the individual sections of production.

The final inspection of the products manufactured by us is again carried out according to IEC 2859 T1, test type II; we differentiate between

- **Critical faults:** risk for life and limb excluding the use of it for electrical reasons or reasons of safety, e.g. failure of the fuse to trip within the defined time-current-limits
- **Major faults:** that impair usability, e.g. poor marking, exceeding of tolerances of the measurements, and
- **Minor faults:** that impair appearance.

The electrical characteristic curve test of the fuse links is carried out in accordance with the actually valid standard or the LWS (Littelfuse works standard). As this is a destructive test, it is based on a consideration of extreme values, i.e. fuse links with a high voltage loss are used for assessing the non-fusing current and fuse links with a small voltage loss are used for assessing the fusing current.

Für die Produktion von Sicherungen hoher Qualität sind gute Kenntnisse und langjährige Erfahrungen über diese Bauelemente Voraussetzung. Die Qualitätssicherung beginnt bereits mit der richtigen Auswahl der Konstruktion, des Materials, der Fertigungsart, des Fertigungsverfahrens usw., damit die vorgegebenen Forderungen erfüllt werden. So werden zur Qualitätssicherung alle relevanten Merkmale der Bauelemente einbezogen.

Als Qualitätsziel wird die 100%-ige Produktqualität angestrebt.

Zur Qualitätssicherung im einzelnen:

Das Qualitätssicherungssystem basiert auf der internationalen Norm DIN EN ISO 9001:2000, ist auf die besonderen Anforderungen für Schutzelemente zugeschnitten und wird durch unabhängige Zertifizierungsinstitute überprüft.

Die Zertifizierung erfolgte in Übereinstimmung mit:

- ISO/TS 16949:2002
- DIN EN ISO 9001:2000
- DIN EN ISO 14001

und wird jährlich mit einer erneuten Auditierung durch das Zertifizierungsinstitut bestätigt.

Die Zukaufteile werden in der Wareneingangskontrolle nach dem Stichprobensystem, das in der IEC 410 (DIN ISO 2859 T1, MIL-STD 105 D) festgelegt ist, geprüft. In gleicher Weise werden die in unserem Hause produzierten Einzelteile und Baugruppen behandelt. Während der Produktion sind an den einzelnen Produktionsabschnitten entsprechende Fertigungskontrollen eingefügt.

Die Endkontrolle unserer gefertigten Produkte wird wiederum nach IEC 2859 T1, Prüfmethode II durchgeführt, wobei unterschieden wird zwischen

- **kritischen Fehlern:** Gefahr für Leib und Leben, die eine Verwendung aus elektrischen oder Sicherheitsgründen ausschließen, z.B. Nichtabschalten der Sicherung innerhalb der festgelegten Zeit-Strom-Grenzwerte
- **schweren Fehlern:** die die Verwendung beeinträchtigen, z.B. schlechte Markierung, Überschreitung der Maßtoleranzen
- **leichten Fehlern:** die das Aussehen beeinträchtigen.

Die elektrische Prüfung der Kennlinie der Sicherungseinsätze wird nach der jeweils gültigen Norm oder der LWN (Littelfuse-Werks-Norm) durchgeführt. Da es sich hierbei um eine zerstörende Betrachtung handelt, wird eine Extremwertbetrachtung zugrunde gelegt. Sicherungseinsätze mit hohem Spannungsverlust werden zur Beurteilung des nicht auslösenden Stromes verwendet und Sicherungseinsätze mit kleinem Spannungsverlust werden zur Beurteilung des auslösenden Stromes verwendet.

Fuse Link Selection / Auswahl der Sicherung

With regard to the product-safety of the device and the life/reliability of the fuse links, a correct choice is important. Only when choosing correctly and when using as agreed (that means corresponding to the level of technology and the valid recommendations, as well as the specified characteristics shown in the data sheets) under consideration of the safety-principle (that is to say "human beings, animals and intrinsic values must be protected against danger") can a definite function of the fuse links as a protection component (rated breakpoint) be possible. The personal responsibility of manufacturers of electrical devices is applicable here:

"Any person involved in the production of electrical systems or the manufacturing of electrical equipment, included those dealing with the operation of such systems or equipment is, according to the present interpretation of the law individually responsible for every aspect of compliance to the recognized rules and procedures of electrical engineering."

1. The necessary voltage rating of a fuse link is established by its required operating voltage (taking into consideration the voltage drop of the fuse link).
- 2.1 The current rating of a fuse link ($I_{N Fuse}$) is established by the max. effective current load ($I_{operating max.}$) taking into consideration the ambient temperature (Factor F_T) and the varying rated current definitions ("constant current" definition) (see Faktor F_I).

$$\text{The following applies: } I_{N Fuse}^3 I_{operating max.} \times F_I \times F_T$$

- 2.2 In case of pulse loading and for semiconductor protection a suitable current rating can also be ascertained with the help of the I^2t -value (current-time-integral).
- 2.3 The above mentioned two points will help you to ascertain the most suitable current rating of a fuse link and its pre-arcing time limits (if necessary verify experimentally).
3. The necessary breaking capacity of the fuse link is determined by the max. possible fault current which can occur.
4. In addition to the above-mentioned points, the method of installation is also important for correct fuse link selection (taking into consideration possible approvals).

With regard to specific conditions of any particular application (product-safety) it is generally necessary to check the fuse link and/or the thermal circuit breaker or holder in the device which is to be protected under normal and fault conditions!

Im Hinblick auf die Produktsicherheit der Bauteile und der Lebensdauer/Zuverlässigkeit der Sicherungseinsätze ist eine korrekte Auswahl wichtig. Denn nur bei korrekter Auswahl und bei einem bestimmungsgemäßen Gebrauch (d.h. entsprechend dem Stand der Technik und der jeweils gültigen Vorschriften sowie den in den Datenblättern spezifizierten Eigenschaften) unter Beachtung des Sicherheitsgrundsatzes (d.h. Menschen, Tiere und Sachwerte vor Gefahren zu schützen) ist eine einwandfreie Funktion der Sicherungseinsätze als Bauelement (Sollbruchstelle) möglich. Es gilt hier die Eigenverantwortung der Hersteller elektrischer Betriebsmittel:

"Wer sich mit der Errichtung elektrischer Anlagen oder der Herstellung elektrischer Betriebsmittel sowie mit dem Betrieb von Anlagen oder Betriebsmitteln befaßt, ist nach herrschender Rechtsauffassung in jedem Einzelfall für die Einhaltung der anerkannten Regeln der Elektrotechnik selbst verantwortlich."

1. Die Betriebsspannung bestimmt die Nennspannung des Sicherungseinsatzes (der Spannungsfall des Sicherungseinsatzes ist zu berücksichtigen).
- 2.1 Der Nennstrom des Sicherungseinsatzes ($I_{N Sich}$) ergibt sich aus dem max. effektiven Betriebsstrom ($I_{Betrieb max.}$) unter Berücksichtigung der Umgebungstemperatur (Faktor F_T) und den unterschiedlichen Definitionen des Nennstromes (Dauerstromdefinition) (Faktor F_I).

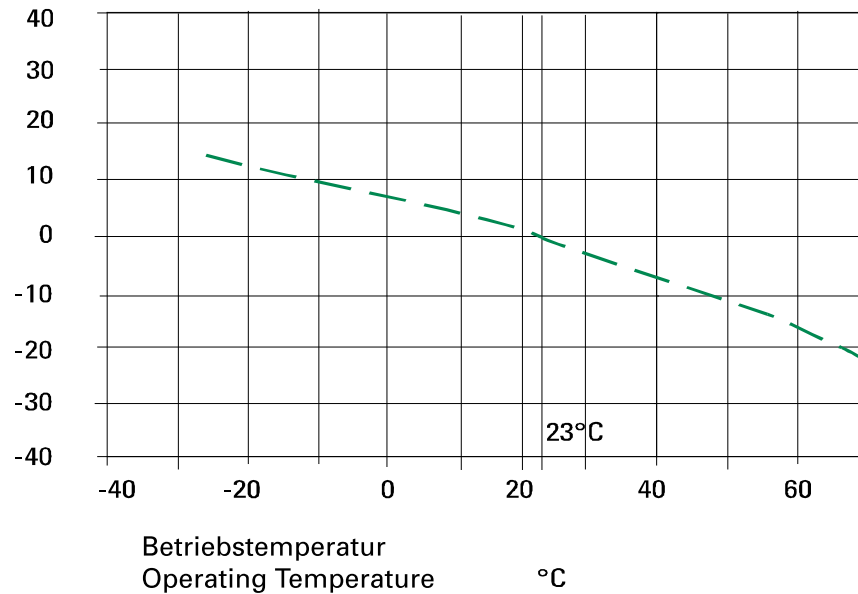
$$\text{Es gilt: } I_{N Sich}^3 I_{Betrieb max.} \times F_I \times F_T$$

- 2.2 Für den Schutz von Halbleiter-Bauelementen und bei Puls-Belastungen erfolgt die Ermittlung des Nennstromes zusätzlich über den I^2t -Wert (Strom-Zeit-Integral).
- 2.3 Die beiden oben genannten Punkte stellen sicher, daß Nennstrom und Schmelzzeit-Grenzwert des Sicherungseinsatzes optimal bestimmt sind (in Zweifelsfällen wird eine experimentelle Überprüfung empfohlen).
3. Das erforderliche Ausschaltvermögen des Sicherungseinsatzes ergibt sich aus dem max. auftretenden Fehlerstrom.
4. Zusätzlich zu dem oben erwähnten Punkten ist die Art der Befestigung ein wichtiger Faktor zur richtigen Auswahl des Sicherungseinsatzes (unter Berücksichtigung evtl. notwendiger Genehmigungen).

Im Hinblick auf die spezifischen Verhältnisse der jeweils vorliegenden Anwendung (Produktsicherheit) ist es generell erforderlich, den Sicherungseinsatz bzw. den thermischen Schutzschalter im zu schützenden Gerät unter Normal- und Fehlerbedingungen zu prüfen!

Fuse Link Selection / Auswahl der Sicherung

I_N -Verschiebung
 I_{rat} -Shifting %



Derating

T_{umg} / °C	%	FT	T_{umg} / °C	%	FT
-25	14	0,877	23	0	1,000
-20	13	0,885	30	-2	1,020
-15	12	0,893	35	-4	1,042
-10	11	0,901	40	-6	1,064
-5	10	0,909	45	-8	1,087
0	9	0,917	50	-10	1,111
5	8	0,926	55	-13	1,149
10	6	0,943	60	-16	1,190
15	4	0,962	65	-19	1,235
20	2	0,980	70	-22	1,282

Relays

<i>ISO MINI® Relays</i>	9
<i>MICRO Relays</i>	10
<i>STARTER Relays</i>	11

ISO MINI® Relays

RoHS



Specifications

Normally open relay:

Color Case: Black
Color Base: Black

Change over relay:

Color Case: Black
Color Base: White

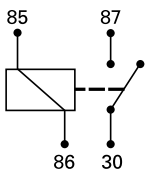
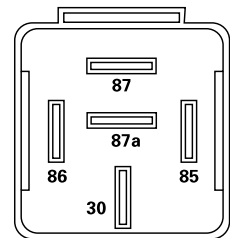
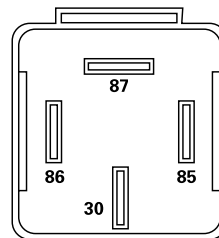
HOMOLOGATION IN ACCORDANCE WITH:

REGULATION N.10 ECE-ONU/02

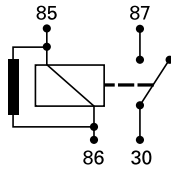
EUROPEAN DIRECTIVE DIR.95/54 CE

Remote control switches for automotive applications available for 12V and 24V rated circuits.

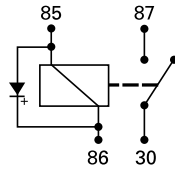
Relais für Anwendungen im Automobilbereich, erhältlich für 12V und 24V Bordnetze.



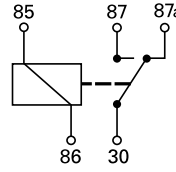
Normally open (A)



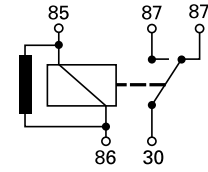
Normally open with Resistor (B)



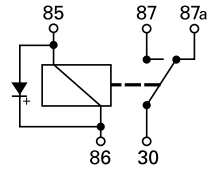
Normally open with Diode (C)



Change Over (A)



Change Over with resistor (B)



Change Over with Diode (C)

Normally open relay

Part Number Artikel-Nr.	Volt	Ampere	Feature Merkmal	Diagram Schema
02040701_	12V	30A	—	A
02040705_	12V	30A	Resistor	B
02040715_	12V	40A	Resistor	B
02040709_	12V	30A	Diode	C
02040702_	24V	20A	—	A
02040706_	24V	20A	Resistor	B
02040710_	24V	20A	Diode	C

Change over relay

Part Number Artikel-Nr.	Volt	Ampere	Feature Merkmal	Diagram Schema
02040703_	12V	20/30A	—	A
02040707_	12V	20/30A	Resistor	B
02040711_	12V	20/30A	Diode	C
02040716_	12V	30/40A	Diode	C
02040704_	24V	10/20A	—	A
02040708_	24V	10/20A	Resistor	B
02040712_	24V	10/20A	Diode	C

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.

MICRO Relays

RoHS

Relays



Specifications

Normally open relay :

Color Case: Black
Color Base: 12V Black / 24V White

Change over relay:

Color Case: Black
Color Base: 12V Black / 24V White

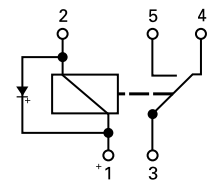
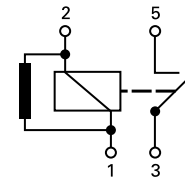
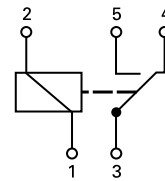
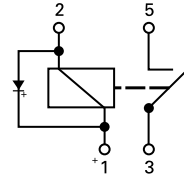
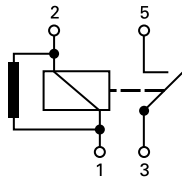
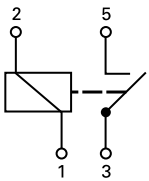
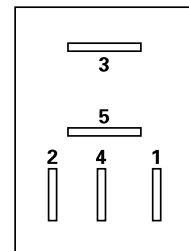
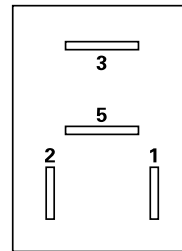
HOMOLOGATION IN ACCORDANCE WITH:

E3 REGULATION N.10 ECE-ONU/02

e3 EUROPEAN DIRECTIVE DIR.95/54 CE

Remote control switches for automotive applications available for 12V and 24V rated circuits.

Relais für Anwendungen im Automobilbereich, erhältlich für 12V und 24V Bordnetze.



Normally Open (A)

Normally Open with Resistor (B)

Normally Open with Diode (C)

Change Over (A)

Change Over with Resistor (B)

Change Over with Diode (C)

Terminal 1 is positive.

Terminal 1 is positive.

Normally open relay

Part Number Artikel-Nr.	Volt	Ampere	Feature Merkmal	Diagram Schema
02040601_	12V	25A	–	A
02040605_	12V	25A	Resistor	B
02040609_	12V	25A	Diode	C
02040602_	24V	10A	–	A
02040606_	24V	10A	Resistor	B
02040610_	24V	10A	Diode	C

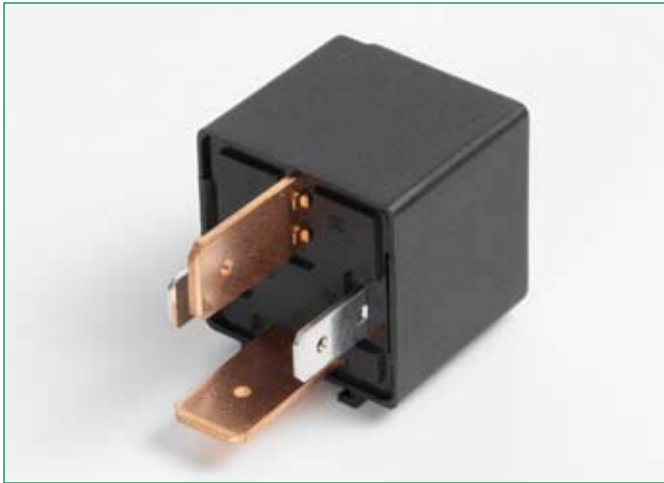
Change over relay

Part Number Artikel-Nr.	Volt	Ampere	Feature Merkmal	Diagram Schema
02040603_	12V	20/10A	–	A
02040607_	12V	20/10A	Resistor	B
02040611_	12V	20/10A	Diode	C
02040604_	24V	15/10A	–	A
02040608_	24V	15/10A	Resistor	B
02040612_	24V	15/10A	Diode	C

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.

STARTER Relays

RoHS



Specifications

Normally open relay

Color Case: Black

Color Base: Black

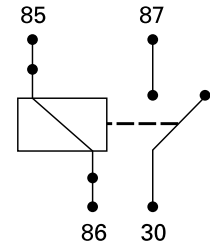
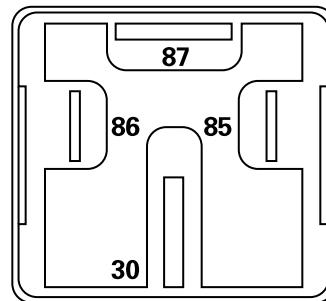
HOMOLOGATION IN ACCORDANCE WITH:

E3 REGULATION N.10 ECE-ONU/02

e3 EUROPEAN DIRECTIVE DIR.95/54 CE

Remote control switches for automotive applications available for 12V and 24V rated circuits.

Relais für Anwendungen im Automobilbereich, erhältlich für 12V und 24V Bordnetze.



Pins nr 30 and 87 are 9.5 mm

Normally open relay

Part Number Artikel-Nr.	Volt	Ampere	Feature Merkmal	Diagram/Schema
02040502_	12V	50A	–	A
02040501_	12V	70A	–	A
02040505_	24V	30A	–	A
02040504_	24V	40A	–	A
02040503_	24V	50A	–	A

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.



Bracket for ISO MINI Relay or STARTER Relay

Part Number Artikel-Nr.
02040700_

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.

Relays

Surface Mount Varistors



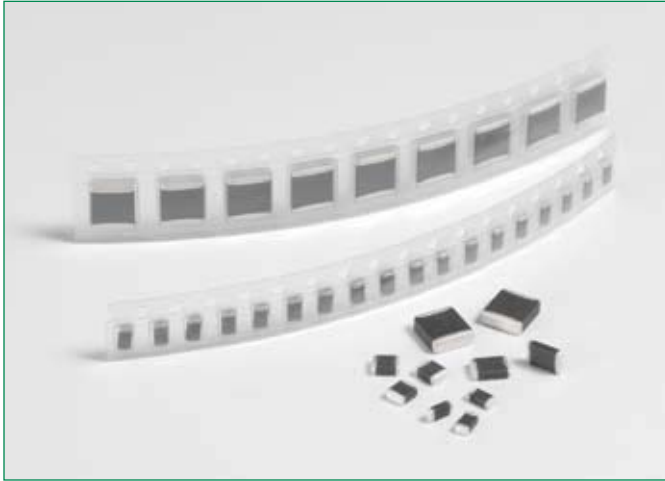
Multilayer Transient Voltage Surge Suppressor

13

Multilayer Transient Voltage Surge Suppressor



RoHS



Multilayer Surface Mount Varistor to suppress transient voltages common to the automobile. The AUML transient suppressors have temperature independent suppression characteristics affording protection from -55°C to 125°C. They offer rugged protection and excellent transient energy absorption in a small package.

Oberflächenmontierbarer Mehrschicht-Varistor zur Unterdrückung von fahrzeugtypischen Spannungsspitzen. Dank temperaturunabhängiger Unterdrückungseigenschaften gewährleisten die AUML-Varistoren einen zuverlässigen Überspannungsschutz von -55°C bis +125°C. Sie bieten einen robusten Schutz und ausgezeichnete Energieabsorption bei kleinen Abmessungen.

AUML Varistor Series

Features

- Lead-Free
- Load Dump Energy Rated per SAE Specification J1113
- Leadless, Surface Mount Chip Form
- "Zero" Lead Inductance
- Variety of Energy Ratings Available
- No Temperature Derating up to 125°C Ambient
- High Peak Surge Current Capability
- Low Profile, Compact Industry Standard Chip Size; (1206, 1210, 1812 and 2220 Sizes)
- Inherent Bidirectional Clamping
- No Plastic or Epoxy Packaging Assures Better than 94V-0 Flammability Rating

Size

Metric Metrisch	EIA
3216	1206
3225	1210
4532	1812
5650	2220

Multilayer Transient Voltage Surge Suppressor



AUML Varistor Series

Absolute Maximum Ratings

For ratings of individual members of a series, see Device Ratings and Specifications chart

- Continuous:** Steady State Applied Voltage:
DC Voltage Range (VM(DC))
- Transient:** Load Dump Energy, (WLD)
Jump Start Capability (5 minutes), (VJUMP)

Operating Temperature Range (TA)

Storage Temperature Range (TSTG)

Temperature Coefficient (av) of Clamping Voltage (VC) at Specified Test Current

AUML SERIES	UNITS
18	V
1.5 to 25	J
24.5	V
-55 to 125	°C
-55 to 150	°C
<0.01	%/°C

CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.
Device Ratings and Specifications

Part Number Artikel-Nr.	Maximum Ratings at 125°C Maximalwerte bei 125°C			Specifications at 25°C Spezifikationen bei 25°C				
	Maximum Continuous DC Voltage Maximale DC Dauerspannung	Jump Start Voltage (5 min) Spannung bei Starthilfe (5 min.)	Load Dump Energy (10 Pulses) Load Dump Energie (10 Pulse)	Nominal Varistor Voltage at 10mA DC Test Current Nominale Varistorspannung bei 10 mA DC Teststrom		Maximum Standby Leakage (at 13VDC) Leckstrom in Bereitschaft (bei 13 V DC)	Maximum Clamping Voltage (VC) at Test Current (8/20 s) Maximale Klemmspannung (Vc) bei 8/20 µs Strompuls	
	$V_{M(DC)}$	V_{JUMP}	W_{LD}	$V_{N(DC) MIN}$	$V_{N(DC) MAX}$	I_L	V_C	I_P
	(V)	(V)	(J)	(V)	(V)	(A)	(V)	(A)
V18AUMLA1206	18	24.5	1.5	23	32	50	40	1.5
V18AUMLA1210	18	24.5	3	23	32	50	40	1.5
V18AUMLA1812	18	24.5	6	23	32	100	40	5
V18AUMLA2220	18	24.5	25	23	32	200	40	10

For automotive 24V and 42V applications please contact your Littelfuse representative or visit www.littelfuse.com for the latest product update.

NOTES:

1. Average power dissipation of transients not to exceed 0.1W, 0.15W, 0.3W and 1W for model sizes 1206, 1210, 1812 and 2220 respectively.
2. Load dump energy rating (into the suppressor) of a voltage transient with a resultant time constant of 115ms to 230ms.
3. Thermal shock capability per Mil-Std-750, Method 1051: -55°C to 125°C, 5 minutes at 25°C, 25 Cycles: 15 minutes at each extreme.
4. For application specific requirements, please contact Littelfuse.

Power Dissipation Ratings

When transients occur in rapid succession, the average power dissipation is the energy (watt-seconds) per pulse times the number of pulses per second. The power so developed must be within the specifications shown on the Device Ratings and Characteristics table for the specific device. Certain parameter ratings must be derated at high temperatures as shown in Figure 1.

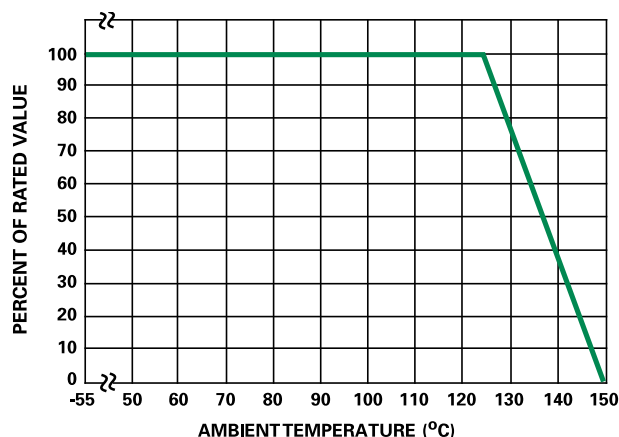


FIGURE 1. CURRENT, ENERGY AND POWER DERATING CURVE

Multilayer Transient Voltage Surge Suppressor



AUML Varistor Series

V-I Characteristics Curves

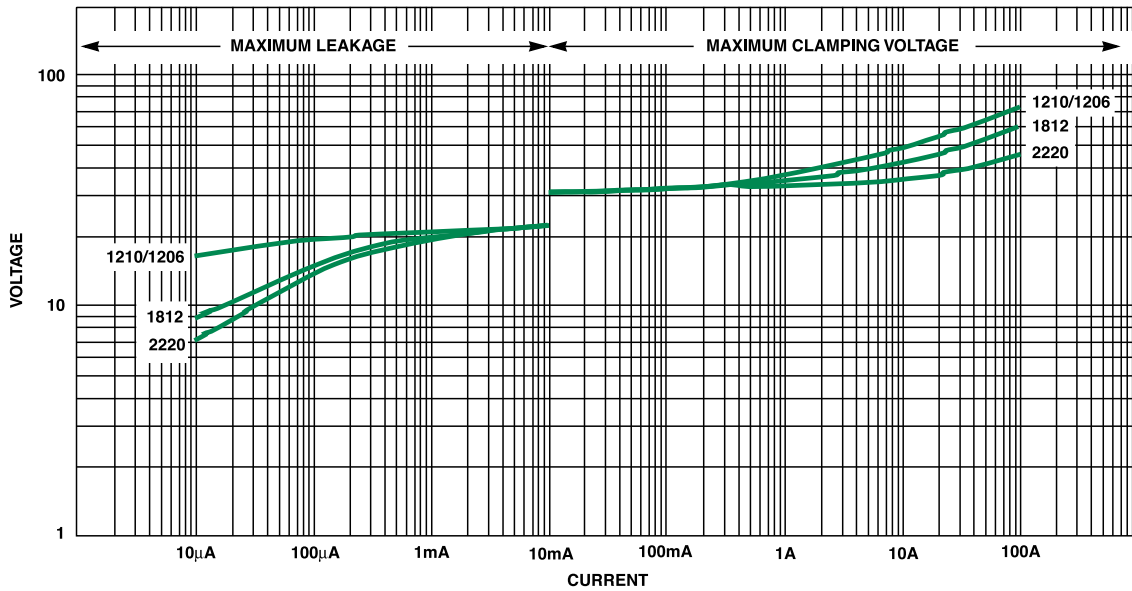


FIGURE 2. MAXIMUM LEAKAGE CURRENT/CLAMPING VOLTAGE CURVE FOR AUML SERIES AT 25°C

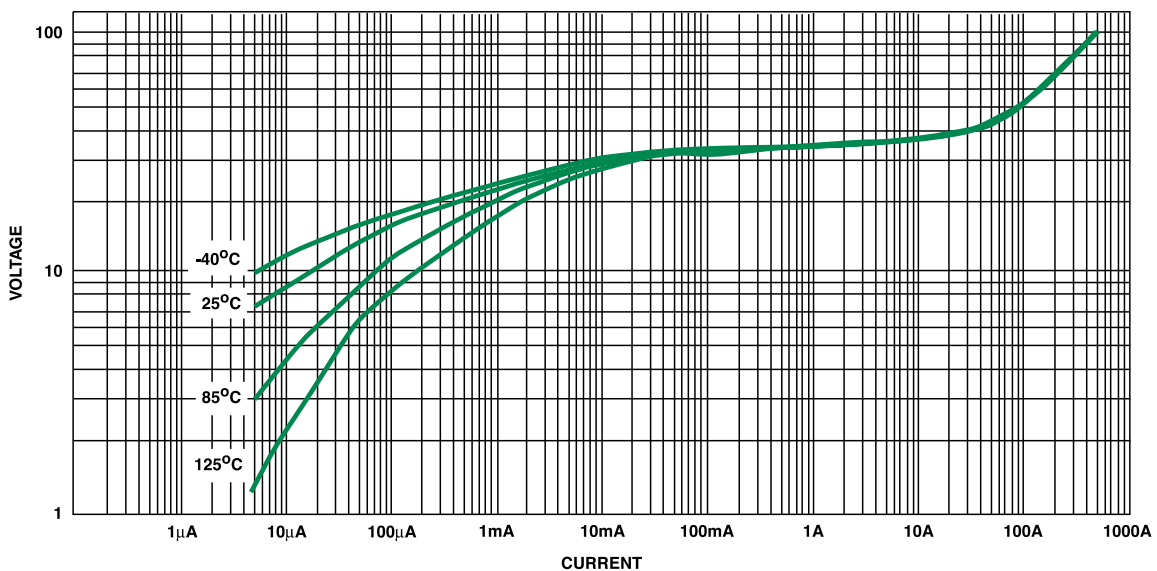


FIGURE 3. TYPICAL V-I CHARACTERISTICS OF THE V18AUMLA2220 at -40°C, 25°C, 85°C AND 125°C

Temperature Effects

In the leakage region of the AUML suppressor, the device characteristics approaches a linear (ohmic) relationship and shows a temperature dependent affect. In this region the suppressor is in a high resistance mode (approaching $10^9\Omega$) and appears as a near open-circuit. Leakage currents at maximum rated voltage are in the microamp range. When clamping transients at

higher currents (at and above the ten milliamp range), the AUML suppressor approaches a 1-10 characteristic. In this region the characteristics of the AUML are virtually temperature independent. Figure 3 shows the typical effect of temperature on the V-I characteristics of the AUML suppressor.

Surface Mount Varistors

Multilayer Transient Voltage Surge Suppressor



AUML Varistor Series

Load Dump Energy Capability

A Load dump transient occurs when the alternator load in the automobile is abruptly reduced. The worst case scenario of this transient occurs when the battery is disconnected while operating at full rated load. There are a number of different load dump specifications in existence in the automotive industry, with the most common one being that recommended by the Society of Automotive Engineers, specification #SAE J1113. Because of the diversity of these load dump specifications Littelfuse defines the load dump energy capability of the AUML suppressor range as that energy dissipated by the device itself, independent of the test circuit setup. The resultant load dump energy handling capability serves as an excellent figure of merit for the AUML suppressor. Standard load dump specifications require a device capability of 10 pulses at rated energy, across a temperature range of -40°C to 125°C. This capability requirement is well within the ratings of all of the AUML series (Figure 5).

Further testing on the AUML series has concentrated on extending the number of load dump pulses, at rated energy, which are applied to the devices. The reliability information thus generated gives an indication of the inherent capability of these devices. As an example of device durability the 1210 size has been subjected to over 2000 pulses at its rated energy of 3 joules; the 1812 size has been pulsed over 1000 times at 6 joules and 2220 size has been pulsed at its rated energy of 25 joules over 300 times. In all cases there has been little or no change in the device characteristics (Figure 6).

The very high energy absorption capability of the AUML suppressor is achieved by means of a highly controlled manufacturing process. This technology ensures that a large volume of suppressor material, with an interdigitated layer construction, is available for energy absorption in an extremely small package. Unlike equivalent rated silicon TVS diodes, the entire AUML device volume is available to dissipate the load dump energy. Hence, the peak temperatures generated by the load dump transient are significantly lower and evenly dissipated throughout the complete device (Figure 4). This even energy dissipation ensures that there are lower peak temperatures generated at the P-N grain boundaries of the AUML suppressor.

There are a number of different size devices available in the AUML series, each one with a load dump energy rating, which is size dependent.

Experience has shown that while the effects of a load dump transient is of real concern, its frequency of occurrence is much less than those of low energy inductive spikes. Such low energy inductive spikes may be generated as a result of motors switching on and off, from ESD occurrences, fuse blowing, etc. It is essential that the suppression technology selected also has the capability to suppress such transients. Testing on the V18AUMLA2220 has shown that after being subjected to a repetitive energy pulse of 2 joules, over 6000 times, no characteristic changes have occurred (Figure 7.)

Speed of Response

The clamping action of the AUML suppressor depends on a conduction mechanism similar to that of other semiconductor devices (i.e. P-N Junctions). The apparent slow response time often associated with transient voltage suppressors (Zeners, MOVs) is often due to parasitic inductance in the package and leads of the device and less dependent of the basic material (silicon, zinc oxide). Thus, the single most critical element affecting the response time of any suppressor is its lead inductance. The AUML suppressor is a surface mount device, with no leads or external packaging, and thus, it has virtually zero inductance. The actual response time of a AUML surge suppressor is in the 1 to 5 nanosecond range, more than sufficient for the transients which are likely to be encountered in an automotive environment.

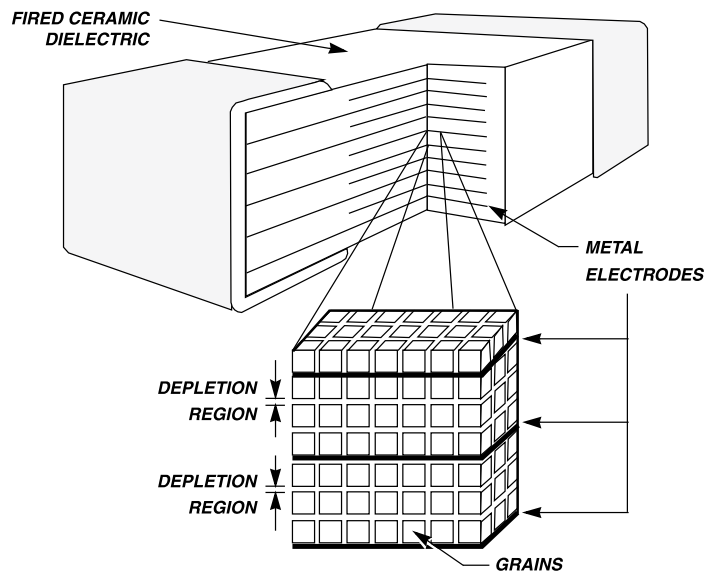


FIGURE 4. INTERDIGITATED CONSTRUCTION OF AUML SUPPRESSOR

Multilayer Transient Voltage Surge Suppressor



AUML Varistor Series

Surface Mount Varistors

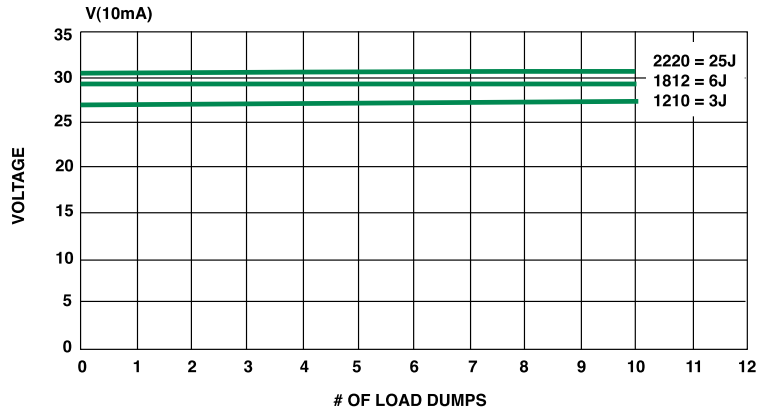


FIGURE 5. AUML LOAD DUMP PULSING OVER A TEMPERATURE RANGE OF -55°C TO 125°C

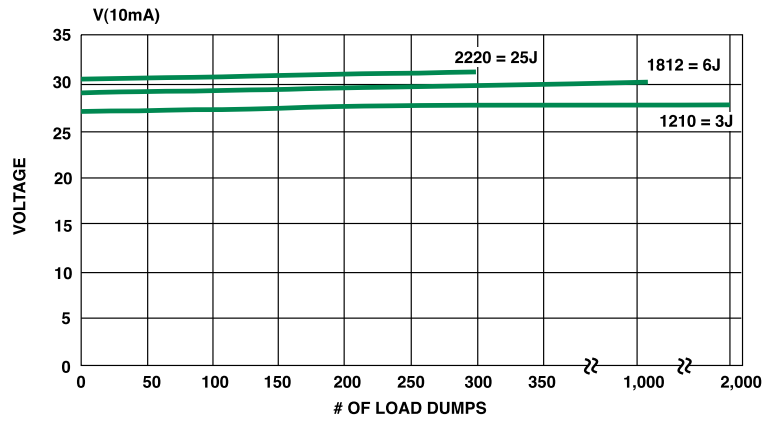


FIGURE 6. REPETITIVE LOAD DUMP PULSING AT RATED ENERGY

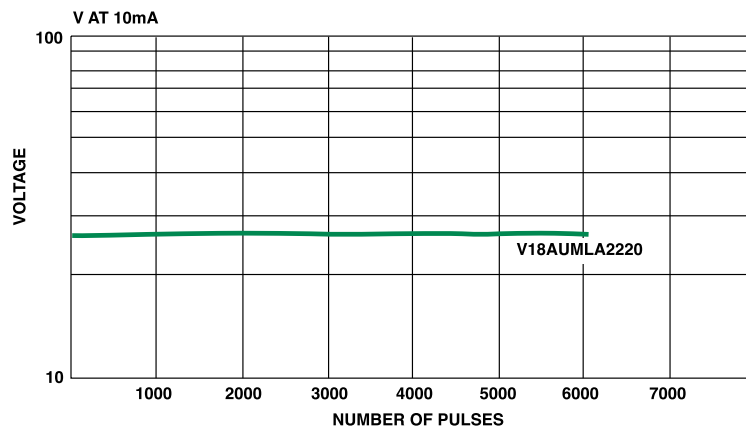


FIGURE 7. REPETITIVE ENERGY TESTING OF THE V18AUMLA2220 AT AN ENERGY LEVEL OF 2 JOULES

Multilayer Transient Voltage Surge Suppressor



AUML Varistor Series

Soldering Recommendations

The principal techniques used for the soldering of components in surface mount technology are Infra Red (IR) Reflow, Vapor Phase Reflow, and Wave Soldering. When wave soldering, the suppressor is attached to the circuit board by means of an adhesive. The assembly is then placed on a conveyor and run through the soldering process to contact the wave. With IR and Vapor Phase Reflow, the device is placed in a solder paste on the substrate. As the solder paste is heated, it reflows and solders the unit to the board.

The recommended solder is a 62/36/2 (Sn/Pb/Ag), 60/40 (Sn/Pb), or 63/37 (Sn/Pb). Littelfuse also recommends an RMA solder flux.

Wave soldering is the most strenuous of the processes. To avoid the possibility of generating stresses due to thermal shock, a preheat stage in the soldering process is recommended, and the peak temperature of the solder process should be rigidly controlled.

When using a reflow process, care should be taken to ensure that the chip is not subjected to a thermal gradient steeper than 4 degrees per second; the ideal gradient being 2 degrees per second. During the soldering process, preheating to within 100 degrees of the solders peak temperature is essential to minimize thermal shock. Examples of the soldering conditions for the AUML Series of suppressors are given in the tables below.

Once the soldering process has been completed, it is still necessary to ensure that any further thermal shocks are avoided. One possible cause of thermal shock is hot printed circuit boards being removed from the solder process and subjected to cleaning solvents at room temperature. The boards must be allowed to gradually cool to less than 50°C before cleaning.

Termination Options

Littelfuse offers two types of electrode termination finish for the Multilayer product series:

1. Silver/Platinum (standard)
2. Silver/Palladium (optional)

Surface Mount Varistors

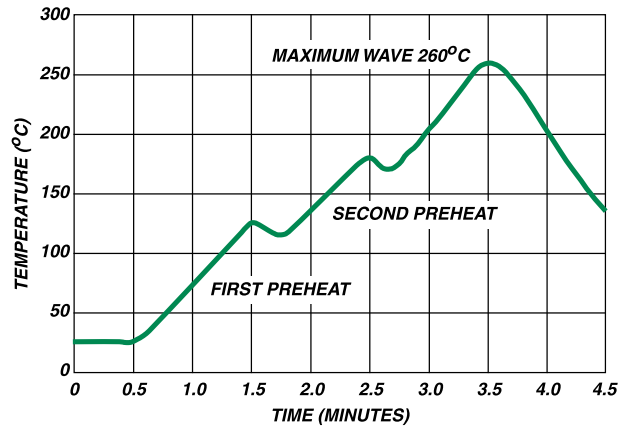


FIGURE 8. WAVE SOLDER PROFILE

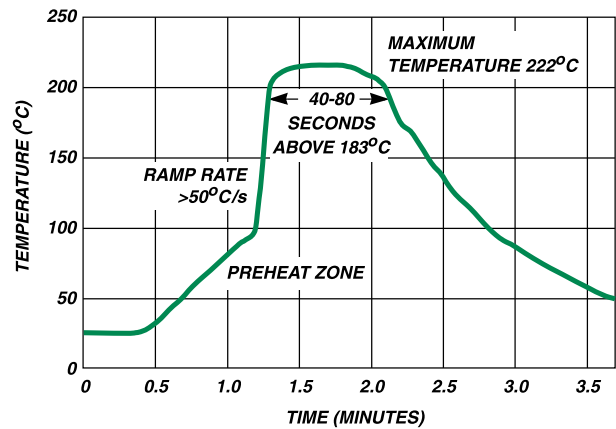


FIGURE 9. VAPOR PHASE SOLDER PROFILE

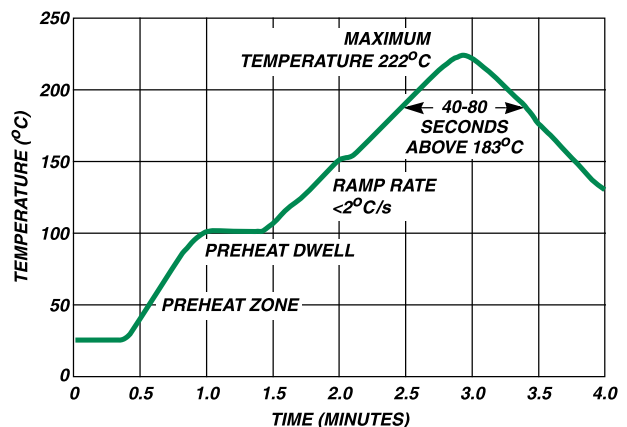


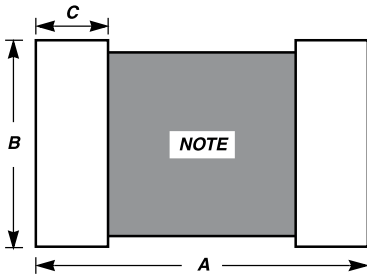
FIGURE 10. REFLOW SOLDER PROFILE

Multilayer Transient Voltage Surge Suppressor



AUML Varistor Series

Recommended Pad Outline



NOTE: Avoid metal runs in this area.

Explanation of Terms

Maximum Continuous DC Working Voltage (VM(DC))

This is the maximum continuous DC voltage which may be applied, up to the maximum operating temperature (125°C), to the ML suppressor. This voltage is used as the reference test point for leakage current and is always less than the breakdown voltage of the device.

Load Dump Energy Rating (WLD)

This is the actual energy the part is rated to dissipate under load dump conditions (not to be confused with the "source energy" of a load dump test specification).

Maximum Clamping Voltage (VC)

This is the peak voltage appearing across the suppressor when measured at conditions of specified pulse current and specified waveform (8/20µs). It is important to note that the peak current and peak voltage may not necessarily be coincidental in time.

Leakage Current (IL)

In the nonconducting mode, the device is at a very high impedance (approaching 10⁶Ω at its rated working voltage) and appears as an almost open circuit in the system. The leakage current drawn at this level is very low (<25µA at ambient temperature) and, unlike the zener diode, the multilayer TVS has the added advantage that, when operated up to its maximum temperature, its leakage current will not increase above 500µA.

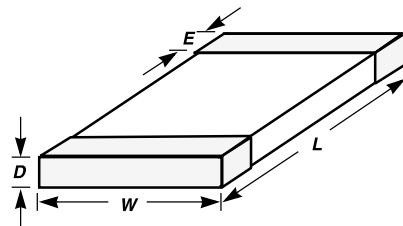
Nominal Voltage (VN(DC))

This is the voltage at which the AUML enters its conduction state and begins to suppress transients. In the automotive environment this voltage is defined at the 10mA point and has a minimum (VN(DC) MIN) and maximum (VN(DC) MAX) voltage specified.

Mechanical Dimensions

Symbol	Chip Size Bauteilgröße							
	1206		1210		1812		2220	
	IN	MM	IN	MM	IN	MM	IN	MM
A	0.203	5.15	0.219	5.51	0.272	6.91	0.315	8.00
B	0.103	2.62	0.147	3.73	0.172	4.36	0.240	6.19
X	0.065	1.65	0.073	1.85	0.073	1.85	0.073	1.85

Symbol	Chip Size Bauteilgröße							
	1206		1210		1812		2220	
	IN	MM	IN	MM	IN	MM	IN	MM
D MAX	0.071	1.80	0.070	1.80	0.070	1.80	0.118	3.00
E	0.02 ±0.01	0.50 ±0.25	0.02 ±0.01	0.50 ±0.25	0.02 ±0.01	0.5 ±0.25	0.03 ±0.01	0.75 ±0.25
L	0.125 ±0.012	3.20 ±0.03	0.125 ±0.012	3.20 ±0.30	0.18 ±0.014	4.5 ±0.35	0.225 ±0.016	5.7 ±0.4
W	0.06 ±0.011	1.60 ±0.28	0.10 ±0.012	2.54 ±0.30	0.125 ±0.012	3.2 ±0.30	0.197 ±0.016	5.0 ±0.4

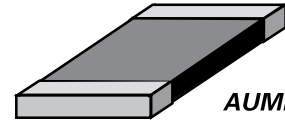


Multilayer Transient Voltage Surge Suppressor

RoHS

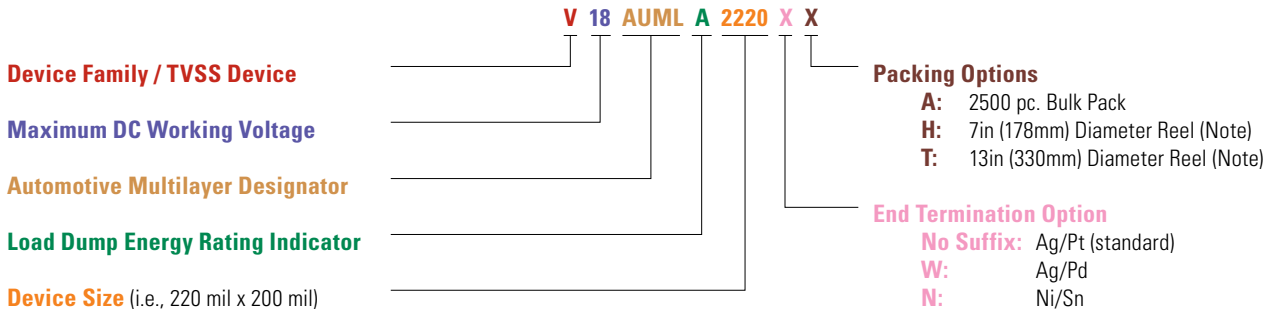
AUML Varistor Series

Ordering Information



AUML SERIES

V18AUMLAXXX TYPES



NOTE: All parts with Ag/Pt (Standard - No suffix) and Ag/Pd (W suffix) end terminations will be upgraded to Ni/Sn plated end terminations as standard, effective August 3, 2006.

Note: See quantity table

Standard Shipping Quantities

Device Size Bauteilgröße	"13" Inch Reel ("T" Option) 13" Inch Spule ("T" Option)	"7" Inch Reel ("H" Option) 7" Inch Spule ("H" Option)	Bulk Pack ("A" Option) Industrieverpackung ("A" Option)
1206	10,000	2,500	2,500
1210	8,000	2,000	2,500
1812	4,000	1,000	2,500
2220	4,000	1,000	2,500

Tape and Reel Specifications

- Conforms to EIA - 481, Revision A
- Can be Supplied to IEC Publication 286 - 3

Tape Gurt	8mm Wide Tape 8mm Gurtbreite		12mm Wide Tape 12mm Gurtbreite	
Chip Size	1206	1210	1812	2220

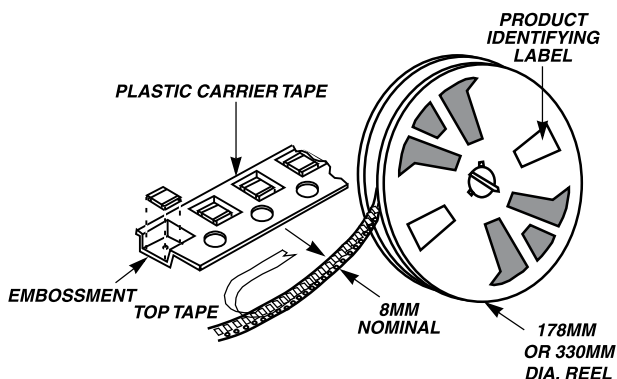
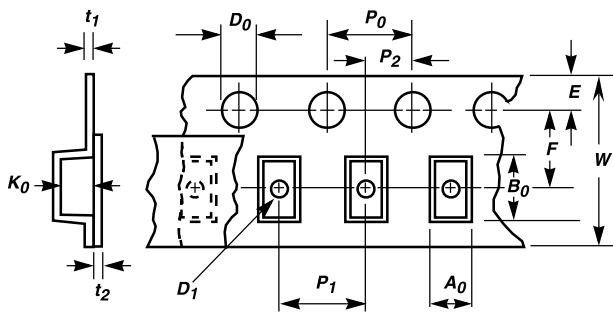
Multilayer Transient Voltage Surge Suppressor



AUML Varistor Series

Symbol	Description Beschreibung	Tape Width Gurtbreite	
		8mm	12mm
A ₀	Width of Cavity	Dependent on chip size to minimize rotation	
B ₀	Length of Cavity	Dependent on chip size to minimize rotation	
K ₀	Depth of Cavity	Dependent on chip size to minimize rotation	
W	Width of Tape	8 ± 0.2	12 ± 0.2
F	Distance between drive hole centers and cavity centers	3.5 ± 0.5	5.4 ± 0.5
E	Distance between drive hole centers and tape edge	1.75 ± 0.1	
P ₁	Distance between cavity center	4 ± 0.1	8 ± 0.1
P ₂	Axial distance between drive hole centers and cavity centers	2 ± 0.1	
P ₀	Axial distance between drive hole centers	8 ± 0.1	
D ₀	Drive hole diameter	1.55 ± 0.05	
D ₁	Diameter of cavity piercing	1.05 ± 0.05	1.55 ± 0.05
t ₁	Embossed tape thickness	0.3 Max	0.4 Max
t ₂	Top tape thickness	0.1 Max	

NOTE: Dimensions in millimeters



Standard Packaging

Tape and reel is the standard packaging method of the AUML series. The standard 300 millimeter (13 inch) reel utilized contains 4000 pieces for the 2220 and 1812 chips, 8000 pieces for the 1210 chip and 10,000 pieces for the 1206 size. To order add "T" to the standard part number, e.g. V18AUMLA2220T.

Special Packaging

- Option 1: 178 millimeter (7 inch) reels containing 1000 (2220, 1812), 2000 (1210), 2500 (1206), pieces are available. To order add "H" to the standard part number, e.g. V18AUMLA2220H.
- Option 2: For small sample quantities (less than 100 pieces) the units are shipped bulk pack. To order add "A" to the standard part number, e.g. V18AUMLA2220A.

Surface Mount Varistors

Resettable PTCs



<i>1206L Series Surface Mount PTCs</i>	23
<i>1812L Series Surface Mount PTCs</i>	25
<i>30R Series Radial Leaded PTCs</i>	27
<i>60R Series Radial Leaded PTCs</i>	29

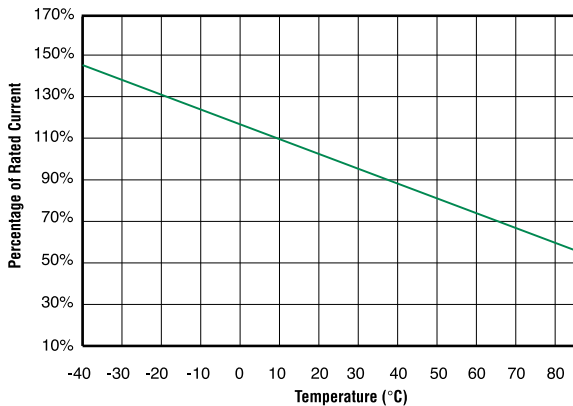
1206L Series



Surface mount resettable overcurrent protection devices in 1206 footprint. Based on PPTC material. Current ratings 200 mA – 1.6 A, 6 VDC – 15 VDC.

Oberflächenmontierbare, rückstellbare Überstromschutz-Bauelemente auf PPTC-Basis, Baugröße 1206. Nennstrom 200 mA bis 1,6 A, 6 VDC bis 15 VDC.

Temperature Derating Curve:



Temperature Derating:

Part Number Teilenummer	Operating Temperature / Betriebstemperatur									
	-40°C	-20°C	0°C	20°C	40°C	50°C	60°C	70°C	80°C	85°C
	Hold Current (A) / Haltestrom (A)									
1206L020	0.29	0.26	0.23	0.20	0.17	0.16	0.14	0.13	0.11	0.10
1206L025	0.36	0.33	0.29	0.25	0.21	0.20	0.18	0.16	0.14	0.13
1206L035	0.51	0.46	0.40	0.35	0.30	0.27	0.25	0.22	0.20	0.18
1206L050	0.74	0.67	0.59	0.50	0.44	0.40	0.36	0.32	0.28	0.26
1206L075	1.11	1.00	0.89	0.75	0.65	0.59	0.54	0.48	0.42	0.39
1206L110	1.63	1.46	1.30	1.10	0.96	0.87	0.79	0.70	0.62	0.57
1206L150	2.22	2.00	1.77	1.50	1.31	1.19	1.08	0.96	0.84	0.78
1206L160	2.37	2.13	1.89	1.60	1.40	1.27	1.15	1.02	0.90	0.83

Specifications

RoHS compliant and Lead-Free.

Physical Specifications:

Terminal Material: Tin Plated Copper
Device Labeling: Device is marked with amperage rating code.

Agency Approvals:

Recognized under the Components Program of Underwriters Laboratories and the Acceptance program of CSA. TUV approved.

Agency File Numbers:

UL E183209, CSA LR108832.

Environmental Specifications:

Passive Aging: 85°C, 1000 Hours.
Humidity Aging: 85°C, 85% R.H., 100 hours.
Thermal Shock: 85°C / -40°C, 20 times.
Vibration: MIL-STD 202, Method 201, MIL-STD-883, Method 2007.

Mechanical Shock:

MIL-STD-202, Method 213 test condition I (100 g's, 6 sec.).

Solvent Resistance:

MIL-STD-202, Method 215.

Operating/Storage Temperature:

-40°C to 85°C
 Device should remain in sealed bags prior to use.

Packaging:

8mm tape and reel carrier per EIA 481 Standard.

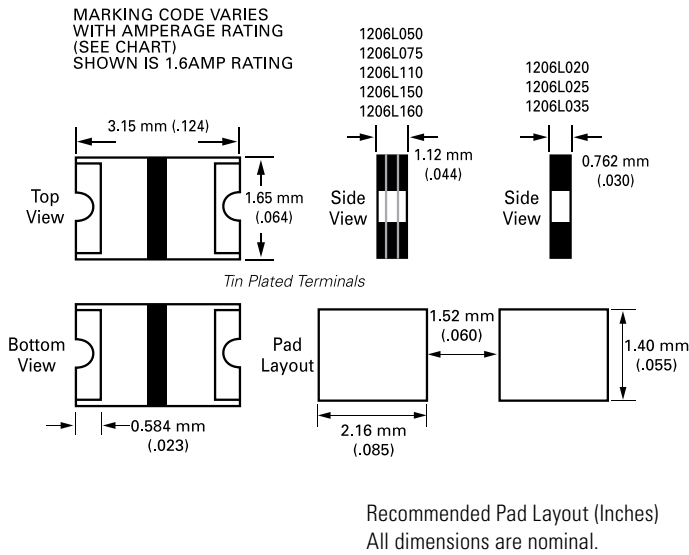
Standard reel quantities:

0.20-0.35A: 4,000 devices on 7" reel (YRT Suffix).
 0.50-1.60A: 3,000 devices on 7" reel (WRT Suffix).

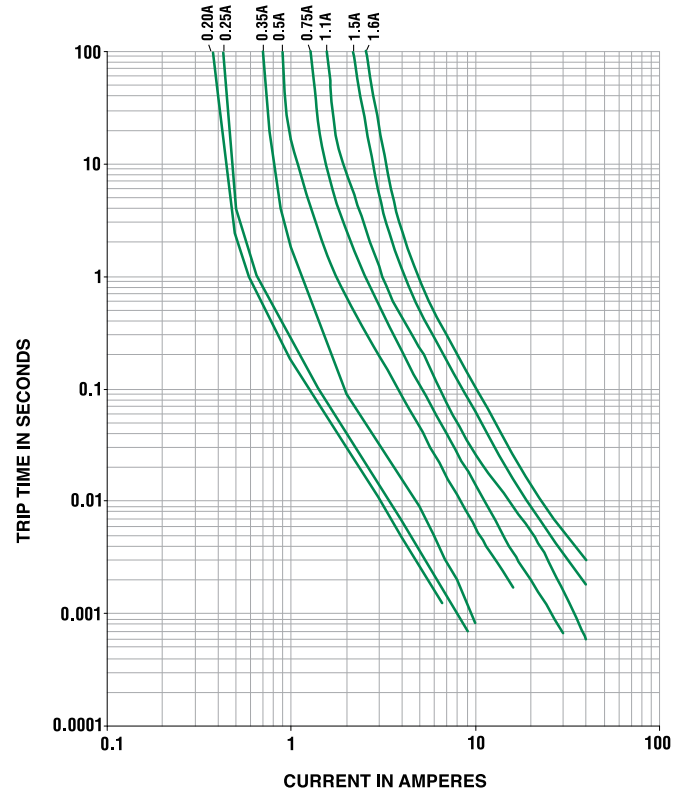
1206L Series



Dimensions (Inches)



Average Time Current Curves



- Solderability:** Meets EIA specification RS186-9E and IPC/EIA J-STD-002, and IPC/EIA J-STD-001.
- Soldering Parameters:** Reflow Solder — 245°C, 20 seconds maximum
Wave Solder — 245°C, 10 seconds maximum

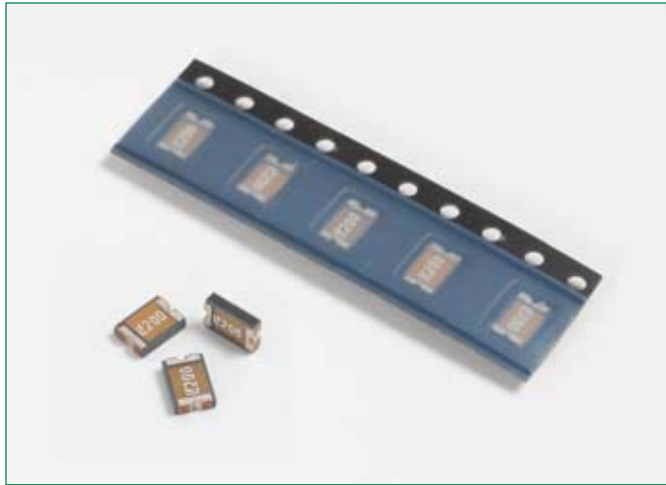
Electrical Characteristics:

Part Number Artikel-Nr.	Marking Code	I_{hold} (A)	I_{trip} (A)	V_{max} (Vdc)	I_{max} (A)	P_d max. (W)	Time to Trip/Schaltzeit		R_{IL} (Ω)	R_{AT} (Ω)
							Current (A)	Time (Sec)		
1206L020	C	0.20	0.40	15.0	40	0.8	8.0	0.05	0.600	2.500
1206L025	D	0.25	0.50	15.0	40	0.8	8.0	0.08	0.550	2.300
1206L035	E	0.35	0.70	6.0	40	0.8	8.0	0.10	0.300	1.300
1206L050	F	0.50	1.00	6.0	40	0.8	8.0	0.10	0.090	0.600
1206L075	G	0.75	1.50	6.0	40	0.8	8.0	0.20	0.070	0.300
1206L110	H	1.10	2.20	6.0	40	0.8	8.0	0.30	0.040	0.180
1206L150	K	1.50	3.00	6.0	40	0.8	8.0	0.30	0.030	0.120
1206L160		1.60	3.20	6.0	40	0.8	8.0	0.40	0.025	0.115

- I_{hold} = Hold Current: maximum current device will sustain for 4 hours without tripping in 20°C still air.
- I_{trip} = Trip Current: minimum current at which the device will trip in 20°C still air.
- V_{max} = Maximum voltage device can withstand without damage at rated current (I_{max})
- I_{max} = Maximum fault current device can withstand without damage at rated voltage (V_{max})
- P_d = Power dissipated from device when in the tripped state at 20°C still air.
- R_{IL} = Minimum resistance of device in initial (unsoldered) state.
- R_{AT} = Maximum measured resistance in the non-tripped state 1 hour after reflow with reflow conditions of 245°C for 20 sec.

CAUTION: Operation beyond the specified ratings may result in damage and possible arcing and flame.

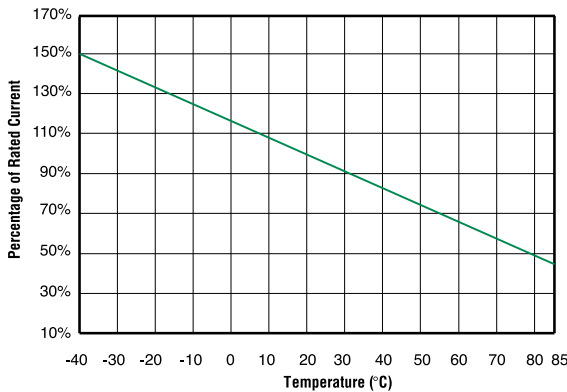
1812L Series



Surface mount resettable over-current protection devices in 1812 footprint. Based on PPTC material. Current ratings 500 mA – 2.6 A, 6 VDC – 15 VDC.

Oberflächenmontierbare, rückstellbare Überstromschutz-Bauelemente auf PPTC-Basis, Baugröße 1812. Nennstrom 500 mA bis 2,6 A; 6 VDC – 15 VDC.

Temperature Derating Curve:



Temperature Derating:

Part Number Artikel-Nr.	Operating Temperature / Betriebstemperatur									
	-40°C	-20°C	0°C	20°C	40°C	50°C	60°C	70°C	80°C	85°C
	Hold Current (A) / Haltestrom (A)									
1812L050	0.75	0.67	0.58	0.50	0.41	0.37	0.33	0.29	0.25	0.23
1812L075	1.13	1.00	0.87	0.75	0.62	0.56	0.50	0.43	0.37	0.34
1812L110	1.65	1.47	1.28	1.10	0.91	0.82	0.73	0.64	0.54	0.50
1812L125	1.88	1.67	1.46	1.25	1.04	0.93	0.83	0.72	0.62	0.56
1812L150	2.25	2.00	1.75	1.50	1.24	1.12	0.99	0.87	0.74	0.68
1812L160	2.40	2.13	1.86	1.60	1.33	1.19	1.06	0.92	0.79	0.72
1812L200	3.00	2.67	2.33	2.00	1.66	1.49	1.32	1.15	0.99	0.90
1812L260	3.90	3.47	3.03	2.60	2.16	1.94	1.72	1.50	1.28	1.17

Specifications

RoHS compliant and Lead-Free.

Physical Specifications:

Terminal Material: Tin Plated Copper
Device Labeling: Device is marked with LF and amperage rating.

Agency Approvals: Recognized under the Components Program of Underwriters Laboratories and the Acceptance program of CSA. TUV approved.

Agency File Numbers: UL E183209, CSA LR108832.

Environmental Specifications:

Passive Aging: 85°C, 1000 Hours.
Humidity Aging: 85°C, 85% R.H., 100 hours.
Thermal Shock: 85°C / -40°C, 20 times.
Vibration: MIL-STD 202, Method 201, MIL-STD-883, Method 2007.
Mechanical Shock: MIL-STD-202, Method 213 test condition I (100 g's, 6 sec.).
Solvent Resistance: MIL-STD-202, Method 215.
Operating/Storage Temperature: -40°C to 85°C
 Device should remain in sealed bags prior to use.

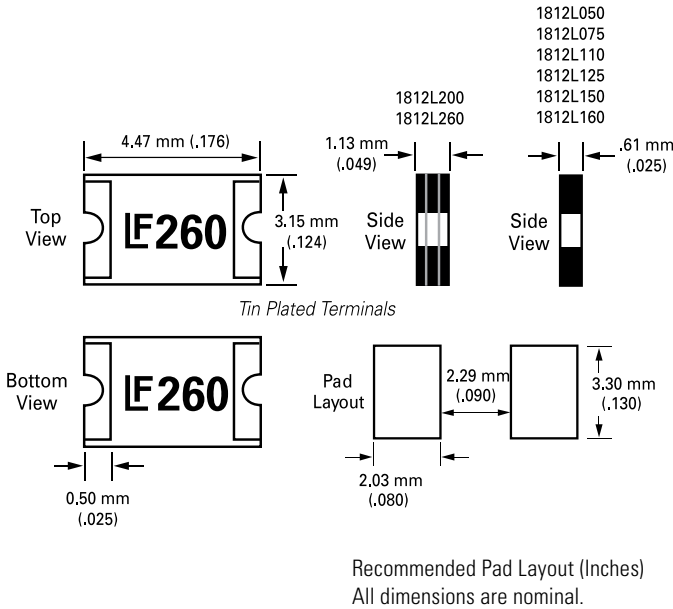
Packaging: 12mm tape and reel carrier per EIA 481 Standard.
Standard reel quantity: 0.50-1.60A: 2,000 devices on 7" reel (PRT Suffix).
 2.00-2.60A: 1,000 devices on 7" reel (MR Suffix).
Optional reel quantity: 0.50-1.60A: 8,000 devices on 13" reel (ZRT Suffix).

Resettable PTCs

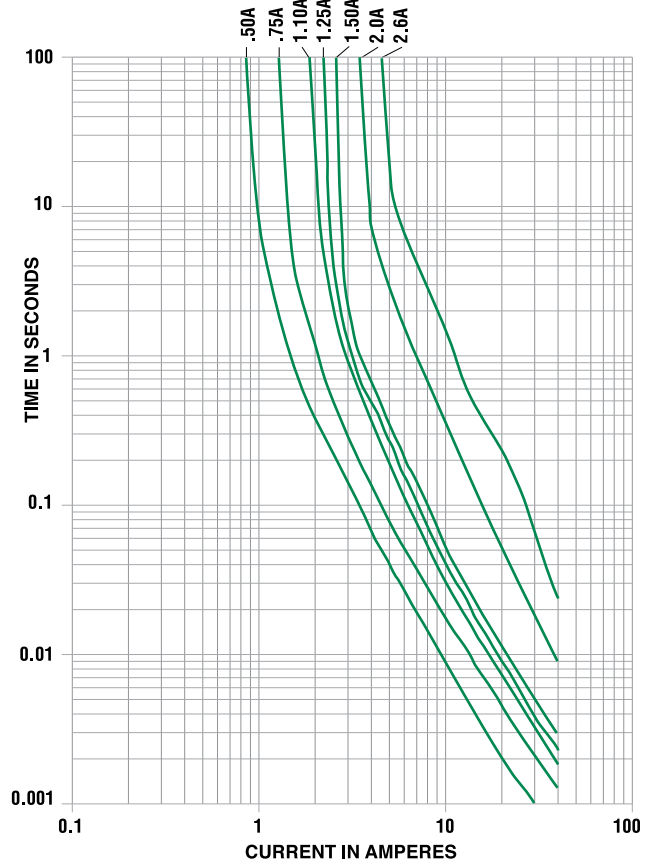
1812L Series



Dimensions (Inches)



Average Time Current Curves



- Solderability:** Meets EIA specification RS186-9E and IPC/EIA J-STD-002, and IPC/EIA J-STD-001.
- Soldering Parameters:** Reflow Solder — 245°C, 20 seconds maximum
Wave Solder — 245°C, 10 seconds maximum

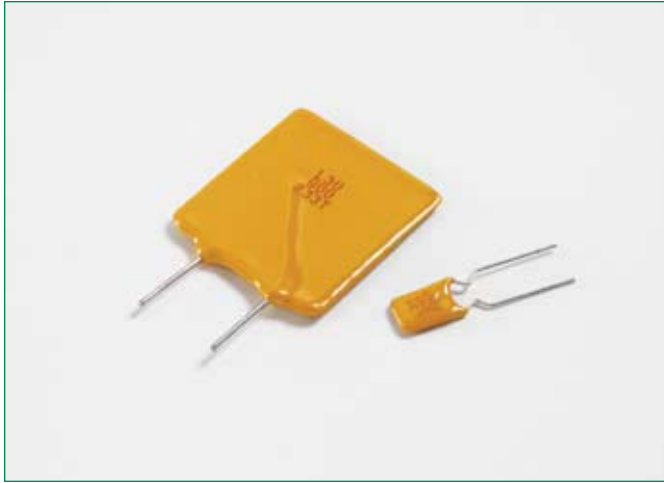
Electrical Characteristics:

Part Number Artikel-Nr.	I_{hold} (A)	I_{trip} (A)	V_{max} (Vdc)	I_{max} (A)	P_d max. (W)	Time to Trip/Schaltzeit		R_{IL} (Ω)	R_{AT} (Ω)
						Current (A)	Time (Sec)		
1812L050	0.50	1.00	15.0	40	0.8	8.0	0.15	0.100	1.000
1812L075	0.75	1.50	13.2	40	0.8	8.0	0.30	0.060	0.420
1812L110	1.10	2.20	6.0	40	0.8	8.0	0.30	0.050	0.226
1812L125	1.25	2.50	6.0	40	0.8	8.0	0.30	0.040	0.184
1812L150	1.50	3.00	6.0	40	0.8	8.0	0.30	0.032	0.137
1812L160	1.60	3.20	6.0	40	0.8	8.0	0.30	0.032	0.099
1812L200	2.00	4.00	6.0	40	0.8	8.0	2.50	0.018	0.070
1812L260	2.60	5.20	6.0	40	0.8	8.0	2.50	0.010	0.050

- I_{hold} = Hold Current: maximum current device will sustain for 4 hours without tripping in 20°C still air.
- I_{trip} = Trip Current: minimum current at which the device will trip in 20°C still air.
- V_{max} = Maximum voltage device can withstand without damage at rated current (I_{max})
- I_{max} = Maximum fault current device can withstand without damage at rated voltage (V_{max})
- P_d = Power dissipated from device when in the tripped state at 20°C still air.
- R_{IL} = Minimum resistance of device in initial (un-soldered) state.
- R_{AT} = Maximum measured resistance in the non-tripped state 1 hour after reflow with reflow conditions of 245°C for 20 sec.

CAUTION: Operation beyond the specified ratings may result in damage and possible arcing and flame.

30R Series



Radial leaded PPTC based resettable over-current protection devices. Current ratings 900 mA – 9 A, up to 30 VDC.

Radial bedrahtete, rückstellbare Überstromschutz-Bauelemente auf PPTC-Basis. Nennstrom 900 mA bis 9 A, bis zu 30 VDC.

Specifications

Agency Approvals: Recognized under the Components Program of Underwriters Laboratory and the Component Acceptance Program of CSA. TUV approved.

Agency File Numbers: UL E183209, CSA LR 108832

Physical Specifications:

Materials: Leads 30R090-250: Tin plated copper-clad steel, 24 AWG (0.020" Dia.)
30R300-900: Tin plated copper, 20 AWG (0.032" Dia.)

Lead Solderability: MIL-STD-202, Method 208E

Coating: Thermoset Coating

Device Labeling: Device is marked with the letter 'L', amperage rating, voltage rating & date code.

Packaging: Standard bulk packaging is 500 pieces per container. Optional tape and reel packaging per EIA 468-B is also available.

Environmental Specifications:

Passive Aging: 85°C, 1000 Hours. ±5% typical resistance change.

Humidity Aging: 85°C, 85% R.H., 1000 hours. ±5% typical resistance change.

Thermal Shock: 85°C / -40°C, 20 times. ±10% typical resistance change.

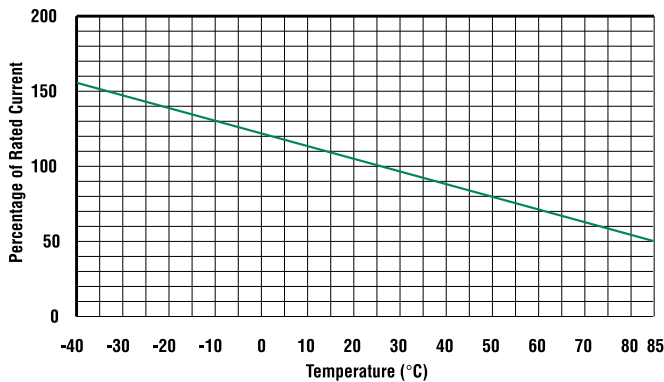
Vibration: MIL-STD 202, Method 201. No resistance change.

Mechanical Shock: MIL-STD-202, Method 213 test condition I (100 g's, 6 sec.). No resistance change.

Max. Surface Temperature: 125°C

Operating/Storage Temperature: -40°C to 85°C

Rerating Curve for 30R Series

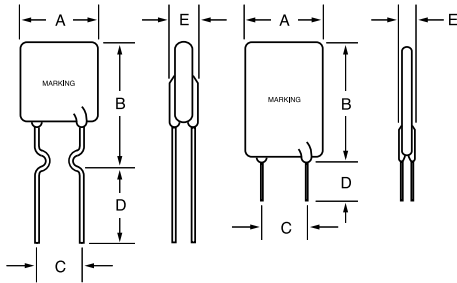


Standard Reel Quantities

Part Number Artikel-Nr.	Reel Quantity Stk. pro Spule
R30R090	3000
R30R110	
R30R135	
R30R160	
R30R185	
R30R250	
R30R300	1500
R30R400	
30R500	Bulk Only 500 Per Container
30R600	
30R700	
30R800	
30R900	

30R Series

Dimensions (Inches)

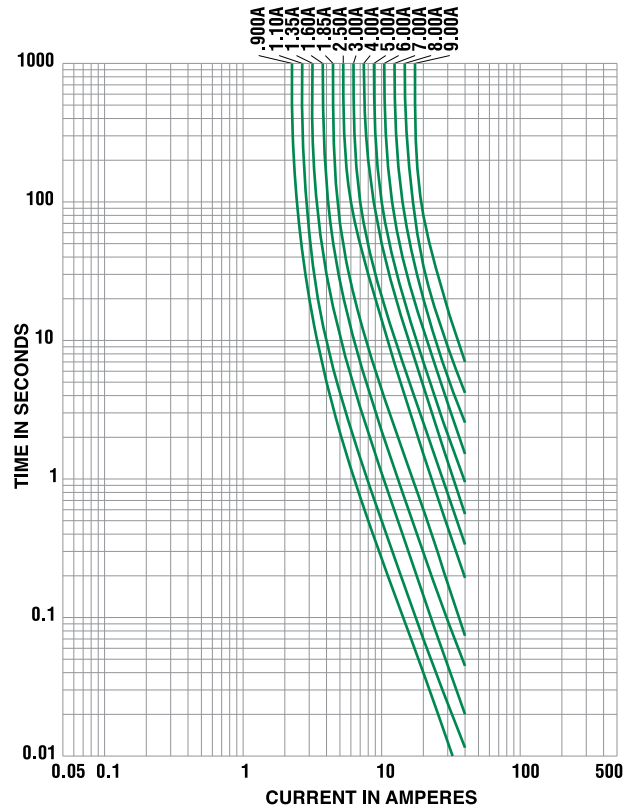


Note: Stand-offs only used for 30R090-30R250

Part Number Artikel-Nr.	'A' (Max.)	'B' (Max.)	'C' (Typ.)
30R090	6.60 (0.26)	12.19 (0.48)	5.08 (0.20)
30R110	6.60 (0.26)	14.22 (0.56)	5.08 (0.20)
30R135	8.89 (0.35)	13.46 (0.53)	5.08 (0.20)
30R160	8.89 (0.35)	15.42 (0.60)	5.08 (0.20)
30R185	10.16 (0.40)	15.75 (0.62)	5.08 (0.20)
30R250	11.43 (0.45)	18.29 (0.72)	5.08 (0.20)
30R300	11.43 (0.45)	17.27 (0.68)	5.08 (0.20)
30R400	13.97 (0.55)	20.07 (0.79)	5.08 (0.20)
30R500	13.97 (0.55)	24.89 (0.98)	10.16 (0.40)
30R600	16.51 (0.65)	24.89 (0.98)	10.16 (0.40)
30R700	19.05 (0.75)	26.67 (1.05)	10.16 (0.40)
30R800	21.59 (0.85)	29.21 (1.15)	10.16 (0.40)
30R900	24.13 (0.95)	29.72 (1.17)	10.16 (0.40)

Dimension 'D' is 7.62 (0.30") Minimum
Dimension 'E' is 3.05 (0.12") Maximum

Average Time Current Curves



Ordering Information:

Part Number Artikel-Nr.	I_{hold} (A)	I_{trip} (A)	V_{max} (Vdc)	I_{max} (A)	P_d max. (W)	Time to Trip/Schaltzeit		Resistance	
						Current (A)	Time (Sec)	R_{IL} (Ω)	R_{AT} (Ω)
30R090	0.90	1.80	30	40	0.6	4.50	5.9	0.070	0.22
30R110	1.10	2.20	30	40	0.7	5.50	6.6	0.050	0.17
30R135	1.35	2.70	30	40	0.8	6.75	7.3	0.040	0.13
30R160	1.60	3.20	30	40	0.9	8.00	8.0	0.030	0.11
30R185	1.85	3.70	30	40	1.0	9.25	8.7	0.030	0.09
30R250	2.50	5.00	30	40	1.2	12.5	10.3	0.020	0.07
30R300	3.00	6.00	30	40	2.0	15.0	10.8	0.020	0.08
30R400	4.00	8.00	30	40	2.5	20.0	12.7	0.010	0.05
30R500	5.00	10.00	30	40	3.0	25.0	14.5	0.010	0.05
30R600	6.00	12.00	30	40	3.5	30.0	16.0	0.005	0.04
30R700	7.00	14.00	30	40	3.8	35.0	17.5	0.005	0.03
30R800	8.00	16.00	30	40	4.0	40.0	18.8	0.005	0.02
30R900	9.00	18.00	30	40	4.2	40.0	20.0	0.005	0.02

- I_{hold} = Hold Current: maximum current device will sustain for 4 hours without tripping in 20°C still air.
- I_{trip} = Trip Current: minimum current at which the device will trip in 20°C still air.
- V_{max} = Maximum voltage device can withstand without damage at rated current (I_{max})
- I_{max} = Maximum fault current device can withstand without damage at rated voltage (V_{max})
- P_d = Power dissipated from device when in the tripped state at 20°C still air.
- R_{IL} = Minimum resistance of device in initial (unsoldered) state.
- R_{AT} = Maximum resistance of device at 20°C measured one hour after tripping.

CAUTION: Operation beyond the specified ratings may result in damage and possible arcing and flame.

60R Series



Radial leaded PPTC based resettable over-current protection devices. Current ratings 100 mA – 3.75 A, up to 60 VDC.

Radial bedrahtete, rückstellbare Überstromschutz-Bauelemente auf PPTC-Basis. Nennstrom 100 mA bis 3,75 A, bis zu 60 VDC.

Specifications

Agency Approvals: Recognized under the Components Program of Underwriters Laboratory and the Component Acceptance Program of CSA. TUV approved.

Agency File Numbers: UL E183209, CSA LR 108832

Physical Specifications:

Materials: Leads

- 60R010: Tin coated constantan, 24 AWG (0.020" Dia.)
- 60R017-040: Tin plated copper-clad steel, 24 AWG (0.020" Dia.)
- 60R050-090: Tin plated copper, 24 AWG (0.020" Dia.)
- 60R110-375: Tin plated copper, 20 AWG (0.032" Dia.)

Lead Solderability: MIL-STD-202, Method 208E

Coating: Thermoset Coating

Device Labeling: Device is marked with the letter 'L', amperage rating, voltage rating & date code.

Packaging: Standard bulk packaging is 500 pieces per container. Optional tape and reel packaging per EIA 468-B is also available.

Environmental Specifications:

Passive Aging: 85°C, 1000 Hours. ±5% typical resistance change.

Humidity Aging: 85°C, 85% R.H., 1000 hours. ±5% typical resistance change.

Thermal Shock: 85°C / -40°C, 20 times. ±10% typical resistance change.

Vibration: MIL-STD 202, Method 201. No resistance change.

Mechanical Shock: MIL-STD-202, Method 213 test condition I (100 g's, 6 sec.). No resistance change.

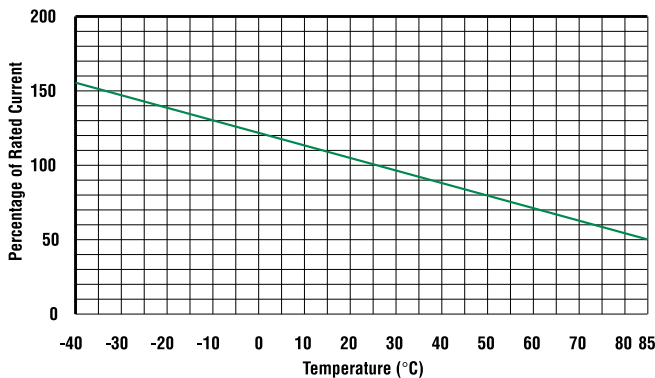
Max. Surface Temperature: 125°C

Operating/Storage Temperature: -40°C to 85°C

Standard Reel Quantities

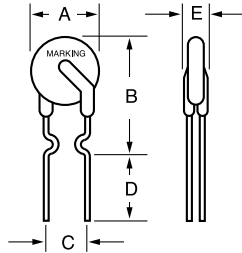
Part Number Artikel-Nr.	Reel Quantity Stck. pro Spule
R60R010	3000
R60R020	
R60R025	
R60R030	
R60R040	
R60R050	
R60R065	
R60R075	2500
R60R090	
R60R017	
R60R110	1500
R60R135	
R60R160	
R60R185	
60R250	
60R300	Bulk Only 500 Per Container
60R375	

Rerating Curve for 60R Series



60R Series

Dimensions (Inches)

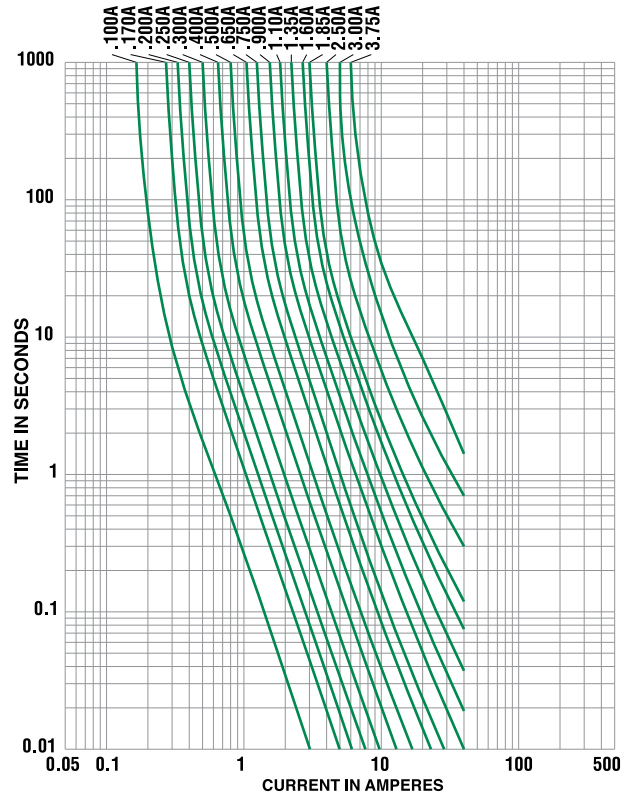


Note: Stand-offs only used for 60R010-60R090

Part Number Artikel-Nr.	'A' (Max.)	'B' (Max.)	'C' (Typ.)
60R010	7.37 (0.29)	12.7 (0.50)	5.08 (0.20)
60R017	7.37 (0.29)	12.7 (0.50)	5.08 (0.20)
60R020	7.37 (0.29)	12.19 (0.48)	5.08 (0.20)
60R025	7.37 (0.29)	12.7 (0.50)	5.08 (0.20)
60R030	7.37 (0.29)	12.95 (0.51)	5.08 (0.20)
60R040	7.62 (0.30)	13.46 (0.53)	5.08 (0.20)
60R050	7.62 (0.30)	13.72 (0.54)	5.08 (0.20)
60R065	9.65 (0.38)	14.48 (0.57)	5.08 (0.20)
60R075	10.41 (0.41)	15.24 (0.60)	5.08 (0.20)
60R090	11.68 (0.46)	15.75 (0.62)	5.08 (0.20)
60R110	12.95 (0.51)	18.0 (0.71)	5.08 (0.20)
60R135	14.48 (0.57)	19.56 (0.77)	5.08 (0.20)
60R160	16.26 (0.64)	21.34 (0.84)	5.08 (0.20)
60R185	17.78 (0.70)	22.86 (0.90)	5.08 (0.20)
60R250	21.34 (0.84)	26.42 (1.04)	10.16 (0.40)
60R300	24.89 (0.98)	29.97 (1.18)	10.16 (0.40)
60R375	28.45 (1.12)	33.53 (1.32)	10.16 (0.40)

Dimension 'D' is 0.30" Minimum; Dimension 'E' is 0.12" Maximum

Average Time Current Curves



Ordering Information

Part Number Artikel-Nr.	I_{hold} (A)	I_{trip} (A)	V_{max} (Vdc)	I_{max} (A)	P_d max. (W)	Time to Trip/Schaltzeit		Resistance	
						Current (A)	Time (Sec)	R_{IL} (Ω)	R_{AT} (Ω)
60R010	0.10	0.20	60	40	0.38	0.50	4.0	2.50	7.50
60R017	0.17	0.34	60	40	0.48	0.85	3.0	3.30	8.00
60R020	0.20	0.40	60	40	0.41	1.00	2.2	1.83	4.40
60R025	0.25	0.50	60	40	0.45	1.25	2.5	1.25	3.00
60R030	0.30	0.60	60	40	0.49	1.50	3.0	0.88	2.10
60R040	0.40	0.80	60	40	0.56	2.00	3.8	0.55	1.29
60R050	0.50	1.00	60	40	0.77	2.50	4.0	0.50	1.17
60R065	0.65	1.30	60	40	0.88	3.25	5.3	0.31	0.72
60R075	0.75	1.50	60	40	0.92	3.75	6.3	0.25	0.60
60R090	0.90	1.80	60	40	0.99	4.50	7.2	0.20	0.47
60R110	1.10	2.20	60	40	1.50	5.50	8.2	0.15	0.38
60R135	1.35	2.70	60	40	1.70	6.75	9.6	0.12	0.30
60R160	1.60	3.20	60	40	1.90	8.00	11.4	0.09	0.22
60R185	1.85	3.70	60	40	2.10	9.25	12.6	0.08	0.19
60R250	2.50	5.00	60	40	2.50	12.50	15.6	0.05	0.13
60R300	3.00	6.00	60	40	2.80	15.00	19.8	0.04	0.10
60R375	3.75	7.50	60	40	3.20	18.75	24.0	0.03	0.08

I_{hold} = Hold Current: maximum current device will sustain for 4 hours without tripping in 20°C still air.

I_{trip} = Trip Current: minimum current at which the device will trip in 20°C still air.

V_{max} = Maximum voltage device can withstand without damage at rated current (I_{max})

I_{max} = Maximum fault current device can withstand without damage at rated voltage (V_{max})

P_d = Power dissipated from device when in the tripped state at 20°C still air.

R_{IL} = Minimum resistance of device in initial (un-soldered) state.

R_{AT} = Maximum resistance of device at 20°C measured one hour after tripping.

CAUTION: Operation beyond the specified ratings may result in damage and possible arcing and flame.

Blade Fuses



<i>MINI® Blade Fuse Rated 32V</i>	32
<i>FK1 MINI® Style Blade Fuse Rated 32V</i>	34
<i>MINI® Blade Fuse Rated 58V</i>	36
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<i>TAC ATO® Style Blade Fuse Rated 58V</i>	46
<i>FKS ATO® Style Blade Fuse Rated 80V</i>	48
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<i>MAXI™ Blade Fuse Rated 32V</i>	51
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<i>TOE MAXI™ Style Blade Fuse Rated 58V</i>	57
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MINI® Blade Fuse Rated 32V

RoHS



Specifications

Interrupting Rating: 1000A @ 32 VDC
Voltage Rating: 32 VDC
Operating Temperature Range: -40°C to +125°C

The MINI Fuse is quickly becoming the new standard for vehicle circuit protection. Its miniature design meets the need for more circuits to be protected while utilizing less space, and its ability to cope with high temperatures in adverse environments makes the MINI Fuse the recommended choice for protection.

Die MINI®-Sicherung entwickelt sich rasch zum neuen Standard für den Schaltungsschutz in Fahrzeugen. Ihr Miniatur-Design ermöglicht es, mehr Schaltkreise bei insgesamt geringerem Platzbedarf zu schützen. Kleinste Abmessungen in Kombination mit der für raue Umgebungsbedingungen erforderlichen hohen Temperaturbelastbarkeit machen die MINI®-Sicherung besonders empfehlenswert.

Time-Current Characteristics / Schmelzeit-Grenzwerte

% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
110	100 hrs. / –
135	0.75 s / 600 s
200	0.15 s / 5 s
350	0.080 s / 0.250 s
600	0.030 s / 0.100 s

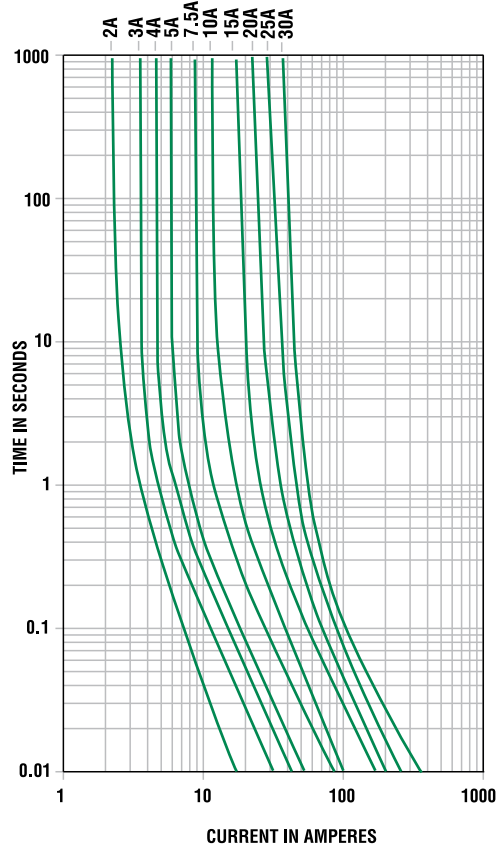
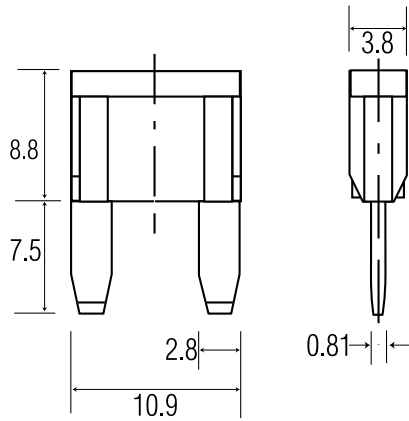
Meets SAE J2077

Part Number Artikel-Nr.	Current Rating Nennstrom	Housing Color Kennfarbe	Typ. Voltage Drop Typ. Spannungsfall	Cold Resistance Kaltwiderstand	I ² t
0297002_	2 A	Grey	171 mV	55.60 mΩ	2.8 A ² s
0297003_	3 A	Purple	153 mV	33.75 mΩ	9.4 A ² s
0297004_	4 A	Pink	121 mV	23.48 mΩ	17 A ² s
0297005_	5 A	Brown	129 mV	17.75 mΩ	25 A ² s
029707.5_	7.5 A	Dark Brown	135 mV	10.85 mΩ	68 A ² s
0297010_	10 A	Red	108 mV	7.42 mΩ	93 A ² s
0297015_	15 A	Blue	98 mV	4.58 mΩ	270 A ² s
0297020_	20 A	Yellow	96 mV	3.21 mΩ	380 A ² s
0297025_	25 A	White	86 mV	2.36 mΩ	625 A ² s
0297030_	30 A	Green	87 mV	1.85 mΩ	1130 A ² s

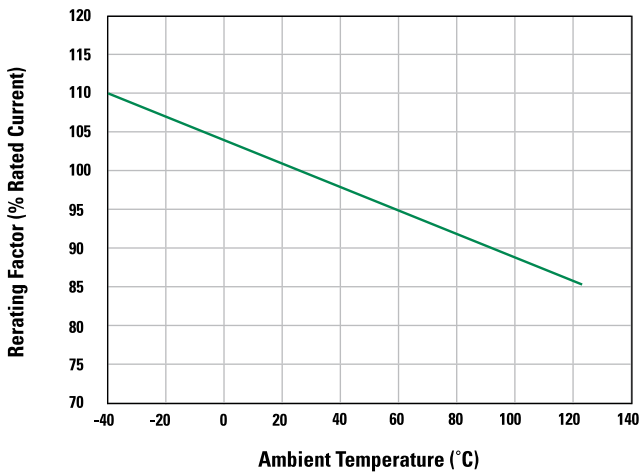
Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.
 Corresponding holder see Section "Fuse Holders."

MINI® Blade Fuse Rated 32V

Dimensions in mm / Maße in mm



MINI Fuse Temperature Derating Curve



See Section Specialty Products for Resistors, Diodes, and Shunts.

FK1 MINI® Style Blade Fuse Rated 32V



Blade Fuses



Specifications

DIN 72581/3F
 ISO 8820
 UL 248 Special Purpose Fuses
cULus Recognized: File No. E211637
Insulating body: Out of thermoplastic (UL 94-V0, heat-resistant)
Cover: Out of thermoplastic (V0, transparent)
 Visible melting-element
 Red, not transparent
Connections: Blade contacts
 Copper alloy, gal. Sn
 Edge-protected
Breaking capacity: 1,000 A, 32 V, DC

The FK1 32V automotive standard fuse link in a MINI® package. Three part construction with copper contacts for excellent reliability in harsh environment conditions with low voltage drop. Current ratings 1A thru 30A. See-through cover for easy detection of blown fuses.

Die FK1 32V-Standardsicherung im MINI®-Gehäuse. Dreiteiliger Aufbau mit Kupferkontakten, niedriger Spannungsabfall und hohe Zuverlässigkeit unter rauen Umgebungsbedingungen. Nennstrom 1A bis 30A, transparente Abdeckung zur leichten Erkennung durchgebrannter Sicherungen.

Time-Current Characteristics / Schmelzeit-Grenzwerte

% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
110	100 h / –
135	750 ms / 1,800 s
200	150 ms / 5 s
350	40 ms / 500 ms
600	20 ms / 100 ms

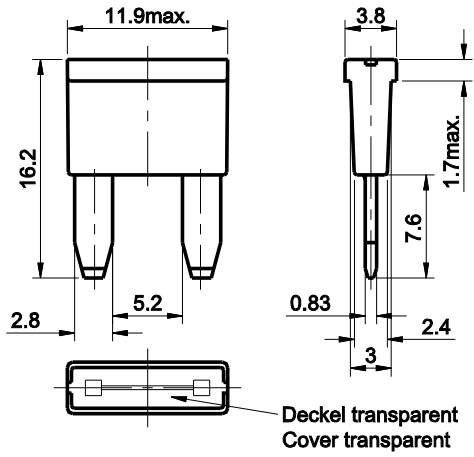
Part Number Artikel-Nr.	Current Rating Nennstrom	Housing Color Kennfarbe	Typ. Voltage Drop Typ. Spannungsfall		Cold Resistance Kaltwiderstand	I ² t
			Standard DIN max.	Littelfuse max.		
168.6785.410_	1 A	Black	225 mV	135 mV	100 mΩ	0.83 A ² s
168.6785.420_	2 A	Grey	200 mV	110 mV	43.0 mΩ	3.31 A ² s
168.6785.430_	3 A	Purple	175 mV	110 mV	27.0 mΩ	7.45 A ² s
168.6785.440_	4 A	Pink	175 mV	110 mV	21.3 mΩ	16.7 A ² s
168.6785.450_	5 A	Brown	175 mV	105 mV	16.2 mΩ	19.8 A ² s
168.6785.475_	7.5 A	Dark Brown	150 mV	100 mV	9.70 mΩ	44.5 A ² s
168.6785.510_	10 A	Red	125 mV	110 mV	7.40 mΩ	79.2 A ² s
168.6785.515_	15 A	Blue	125 mV	105 mV	4.50 mΩ	178 A ² s
168.6785.520_	20* A	Yellow	–	100 mV	3.10 mΩ	331 A ² s
168.6785.525_	25* A	White	–	120 mV	2.60 mΩ	653 A ² s
168.6785.530_	30* A	Green	–	105 mV	1.95 mΩ	1,264 A ² s
160.6785.000_	Shunt* A	White	–	60 mV	1.35 mΩ	1,800 A ² s

* Not mentioned in the standards

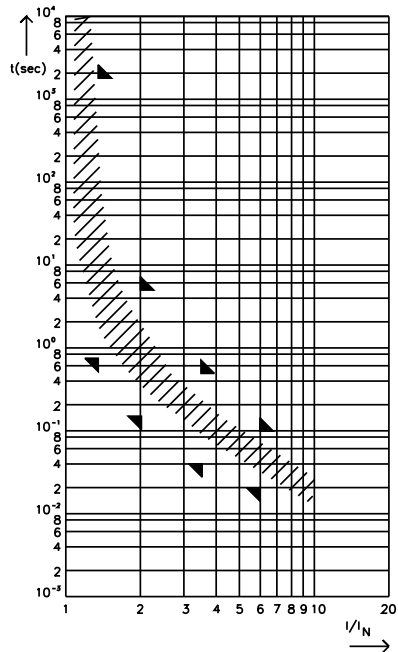
Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.
 Corresponding holder see Section "Fuse Holders."

FK1 MINI® Style Blade Fuse Rated 32V

Dimensions in mm / Maße in mm



Pre-arcing Time - limits / Schmelzeit-Grenzwerte DIN



FI = 1.33 (max. operating current: 0.75 x I_{rat} at 23°C)

Blade Fuses

MINI® Blade Fuse Fuse Rated 58V

RoHS



Specifications

Voltage Rating: 58 VDC
Interrupting Ratings: 1000 amperes @ 58 VDC
Operating Temperature Range: -40°C to +125°C

MINI style fuse for use in 42V Systems. Same Time-Current characteristic as the 32V MINI fuse Fits into standard MINI fuse sockets. Has a rejection feature to prevent fuses with lower voltage rating from being wrongfully inserted into the circuit. Current rating 2A – 30A, 58 VDC max.

Sicherung in MINI®-Bauform für 42V Systeme, gleiche Zeit-Strom-Charakteristik wie die 32V MINI® Sicherung. Die Sicherung passt in Standard-MINI-Sicherungshalter und hat eine Sperrfunktion, die eine versehentliche Verwendung von Sicherungen mit niedrigerer Nennspannung verhindert. Nennstrom 2–30A, 58 VDC max.

Time-Current Characteristics / Schmelzeit-Grenzwerte

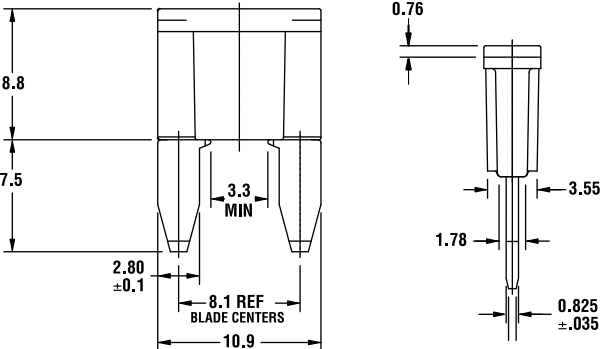
% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
110	100 h / –
135	750 ms / 600 s
200	150 ms / 5 s
350	80 ms / 250 ms
600	30 ms / 100 ms

Part Number Artikel-Nr.	Current Rating Nennstrom	Housing Color Kennfarbe	Typ. Voltage Drop Typ. Spannungsfall	Cold Resistance Kaltwiderstand	I ² t
0997002_	2 A	Grey	171 mV	55.60 mΩ	2.8 A ² s
0997003_	3 A	Purple	153 mV	33.75 mΩ	9.4 A ² s
0997004_	4 A	Pink	121 mV	23.48 mΩ	17 A ² s
0997005_	5 A	Brown	129 mV	17.75 mΩ	25 A ² s
099707.5_	7.5 A	Dark Brown	135 mV	10.85 mΩ	68 A ² s
0997010_	10 A	Red	108 mV	7.42 mΩ	93 A ² s
0997015_	15 A	Blue	98 mV	4.58 mΩ	270 A ² s
0997020_	20 A	Yellow	96 mV	3.21 mΩ	380 A ² s
0997025_	25 A	White	86 mV	2.36 mΩ	625 A ² s
0997030_	30 A	Green	87 mV	1.85 mΩ	1130 A ² s

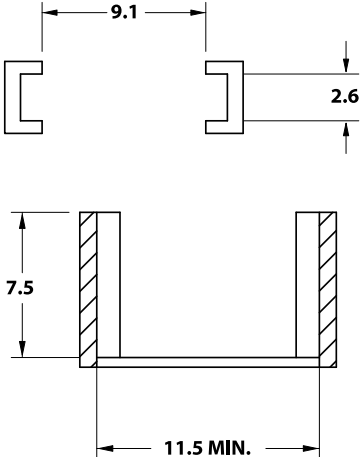
Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.
 Corresponding holder see Section "Fuse Holders."

MINI® Blade Fuse Fuse Rated 58V

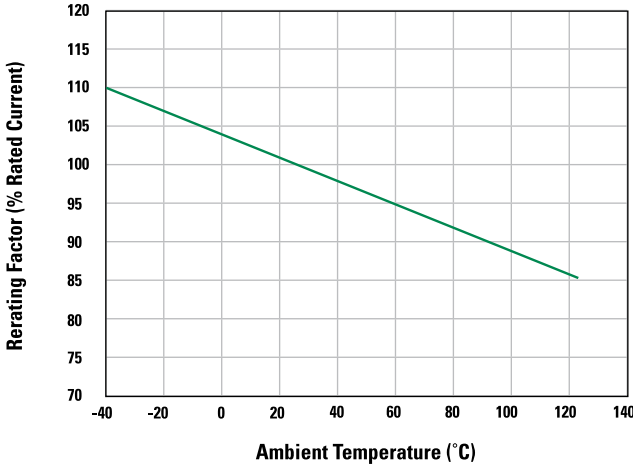
Dimensions in mm / Maße in mm



Recommended Mating Cavity



MINI Fuse Temperature Derating Curve



Blade Fuses

FUN MINI® Style Blade Fuse Rated 125V

RoHS

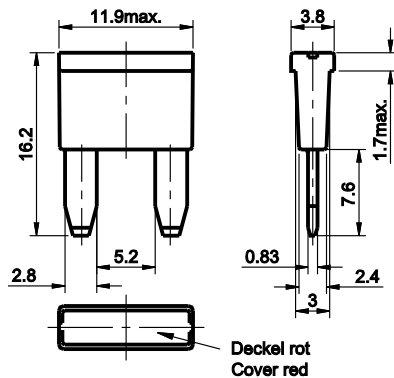
Blade Fuses



The FUN is a 125V rated MINI style fuse. It features a three part construction with copper contacts for excellent reliability in harsh environment conditions and low voltage drop. Current ratings 3A thru 15A. Filled with arc-quenching material.

FUN ist eine 125V Sicherung in MINI-Bauform. Dreiteiliger Aufbau mit Kupferkontakten, niedriger Spannungsabfall und hohe Zuverlässigkeit unter rauen Umgebungsbedingungen. Nennstrom 3A bis 15A. Gefüllt mit Lichtbogen löschendem Material.

Dimensions in mm / Maße in mm



Specifications

LWS

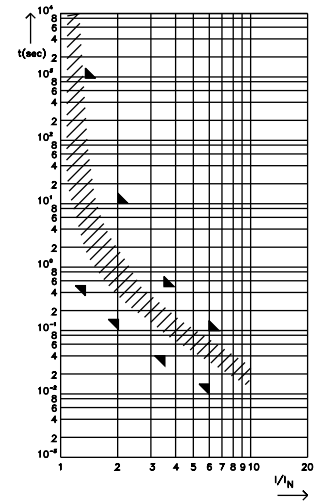
Insulating body: Out of thermoplastic (UL 94-V0, heat-resistant)

Cover: Out of thermoplastic V0
Red, not transparent

Connections: Blade contacts
Copper alloy, gal. Sn
Edge-protected

Breaking capacity: 1,000 A, 125 V, DC

Pre-arcing Time - limits / Schmelzeit-Grenzwerte DIN



FI = 1.43 (max. operating current :
0.7 x I_{rat} at 23°C)

Time-Current Characteristics / Schmelzeit-Grenzwerte

% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
110	100 h / -
135	500 ms / 900 s
200	150 ms / 10 s
350	40 ms / 500 ms
600	15 ms / 100 ms

Part Number Artikel-Nr.	Current Rating Nennstrom	Housing Color Kennfarbe	Typ. Voltage Drop Typ. Spannungsfall	Cold Resistance Kaltwiderstand	I ² t
125.6785.430_	3 A		130 mV	35.0 mΩ	8.50 A²s
125.6785.440_	4 A		120 mV	23.5 mΩ	14.5 A²s
125.6785.450_	5 A		120 mV	18.0 mΩ	25.0 A²s
125.6785.475_	7.5 A		110 mV	11.0 mΩ	60.0 A²s
125.6785.510_	10 A		110 mV	8.00 mΩ	85.0 A²s
125.6785.515_	15 A		110 mV	5.00 mΩ	155 A²s

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.
Corresponding holder see Section "Fuse Holders."

FP1 MINI® Style PCB Fuse Rated 32V



Specifications

LWS

UL 248 Special Purpose Fuses

cULus Recognized: File No. E211637

Insulating body: Out of thermoplastic (UL 94-V0, heat-resistant)**Cover:** Out of thermoplastic (V0, transparent),

Visible melting-element

Shunt: Red, not transparent

Connections: Soldering pins

Copper alloy, gal. Sn













Breaking capacity: 1,000 A, 32 VDC

The FP1 is a MINI style fuse for direct trough-hole pcb soldering. The FP1 has similar performance characteristics as the standard FK1 fuse.

FP1 ist eine Sicherung in MINI-Bauform für direkte Leiterplattenmontage (Durchkontaktierung) mit ähnlichen Leistungsmerkmalen wie die Standard-FK1-Sicherung.

Time-Current Characteristics / Schmelzeit-Grenzwerte

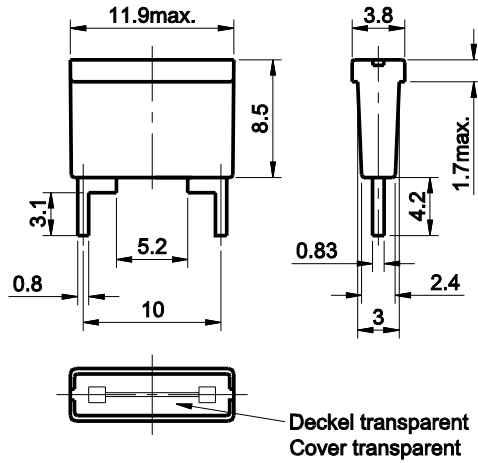
% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
110	100 h / –
135	750 ms / 1,800 s
200	150 ms / 5 s
350	40 ms / 500 ms
600	20 ms / 100 ms

Part Number Artikel-Nr.	Current Rating Nennstrom	Housing Color Kennfarbe	Typ. Voltage Drop Typ. Spannungsfall		Cold Resistance Kaltwiderstand	I ² t
			Standard DIN max.	Littelfuse max.		
168.6585.410_	1 A		225 mV	135 mV	100 mΩ	0.83 A ² s
168.6585.420_	2 A		200 mV	110 mV	43.0 mΩ	3.31 A ² s
168.6585.430_	3 A		175 mV	110 mV	27.0 mΩ	7.45 A ² s
168.6585.440_	4 A		175 mV	110 mV	21.3 mΩ	16.7 A ² s
168.6585.450_	5 A		175 mV	105 mV	16.2 mΩ	19.8 A ² s
168.6585.475_	7.5 A		150 mV	100 mV	9.70 mΩ	44.5 A ² s
168.6585.510_	10 A		125 mV	110 mV	7.40 mΩ	79.2 A ² s
168.6585.515_	15 A		125 mV	105 mV	4.50 mΩ	178 A ² s
168.6585.520_	20 A		–	100 mV	3.10 mΩ	331 A ² s
168.6585.525_	25 A		–	105 mV	2.60 mΩ	653 A ² s
168.6585.530_	30 A		–	105 mV	1.90 mΩ	1,264 A ² s
160.6585.0002	Shunt		–	60 mV	1.35 mΩ	1,800 A ² s

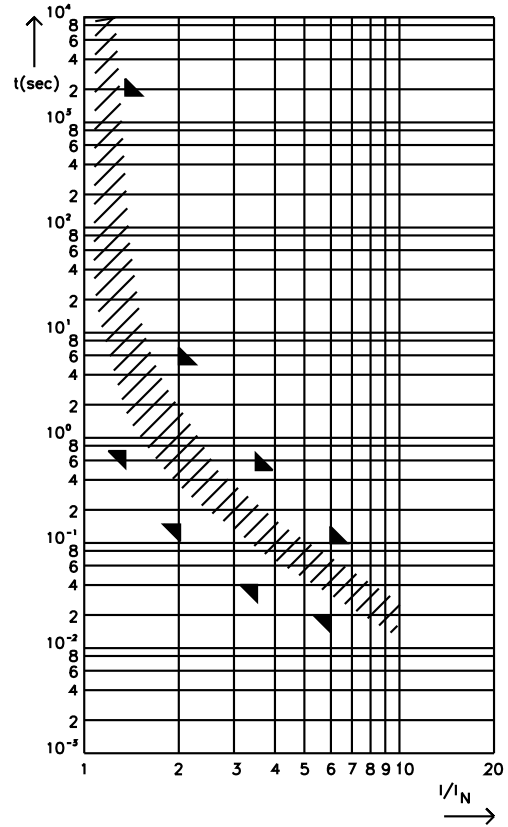
Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.
Corresponding holder see Section "Fuse Holders."

FP1 MINI® Style PCB Fuse Rated 32V

Dimensions in mm / Maße in mm



Pre-arcing Time - limits / Schmelzzeit-Grenzwerte DIN



FI = 1.33 (max. operating current: $0.75 \times I_{rat}$ at 23°C)

Low Profile MINI® Fuses Rated 58V

RoHS

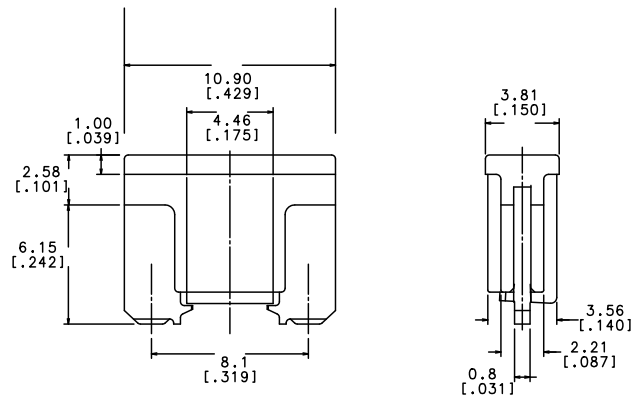

The Low Profile MINI fuse has similar performance characteristics as the standard MINI fuse. The lower overall height allows for more space and weight savings. The Low Profile MINI fuse is designed to mate with tuning-fork terminals, which provides additional weight and material savings in fuse box designs by eliminating the need for female box terminals.

Low-Profile-MINI Sicherungen bieten ähnliche Leistungsmerkmale wie Standard-MINI-Sicherungen. Ihre geringere Gesamthöhe ermöglicht Platz- und Gewichtseinsparungen. Sie sind für offene Kabelschuhe/ Gabelkontakte ausgelegt, sodass Kontaktbuchsen entfallen und zusätzliche Gewichts- und Materialeinsparungen beim Entwurf von Sicherungskästen erzielt werden können.

Specifications











Voltage Rating:	58 VDC
Interrupting Ratings:	1000A @ 32 VDC
Operating Temperature Range:	-40°C to +125°C

Dimensions in mm / Maße in mm



Time-Current Characteristics / Schmelzeit-Grenzwerte

% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
110	100 h / –
135	750 ms / 1800 s
200	150 ms / 5 s
350	80 ms / 250 ms
600	30 ms / 100 ms

Part Number Artikel-Nr.	Current Rating Nennstrom	Housing Color Kennfarbe	Cold Resistance Kaltwiderstand	I ² t
0897002_	2 A		–	–
0897003_	3 A		–	–
0897004_	4 A		–	–
0897005_	5 A		–	–
089707.5_	7.5 A		–	–
0897010_	10 A		–	–
0897015_	15 A		–	–
0897020_	20 A		–	–
0897025_	25 A		–	–
0897030_	30 A		–	–

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.
Corresponding holder see Section "Fuse Holders."

ATO® Blade Fuse Rated 32V

RoHS

Blade Fuses



Specifications

Voltage Rating: 32 VDC
Interrupting Ratings: 1000A @ 32 VDC
Operating Temperature Range: -40°C to +105°C

Developed by Littelfuse for the automotive industry, the ATO fuse has become the original equipment circuit protection standard for foreign and domestic automobiles and trucks. Readily identifiable and easily replaced, this fuse can be specified for a variety of low voltage electronic applications.

Die ATO-Sicherung wurde von Littelfuse speziell für die Fahrzeugindustrie entwickelt und hat sich als OEM-Schaltungsschutz-Standard für in- und ausländische Personen- und Lastkraftwagen etabliert. ATO-Sicherungen lassen sich leicht identifizieren und austauschen und können für zahlreiche Anwendungen im Niederspannungsbereich spezifiziert werden.

Time-Current Characteristics / Schmelzeit-Grenzwerte

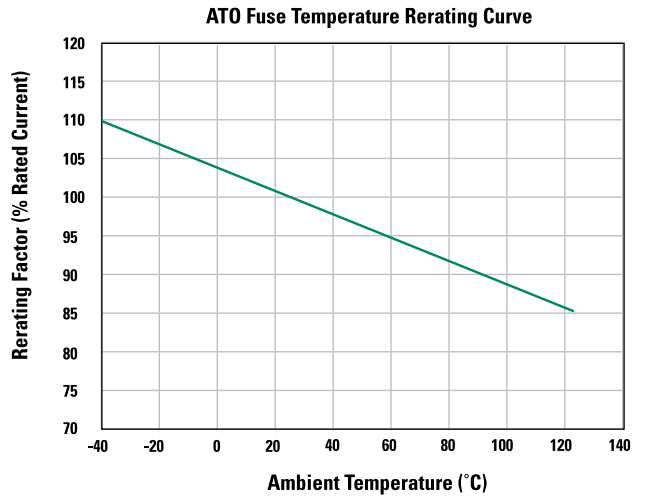
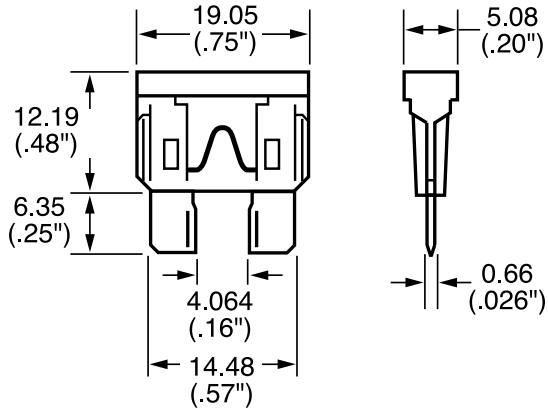
% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
110	100 hrs / –
135	500 ms / 600 s
	750 ms / 600 s
200	100 ms / 5.0 s
	150 ms / 5.0 s
350	20 ms / 500 ms
	80 ms / 500 ms
600	– / 100 ms
	– / 150 ms

Part Number Artikel-Nr.	Current Rating Nennstrom	Housing Color Kennfarbe	Typ. Voltage Drop Typ. Spannungsfall	Cold Resistance Kaltwiderstand	I ² t
0257001_	1 A	Black	176 mV	123 mΩ	0.4 A ² s
0257002_	2 A	Grey	141 mV	53.5 mΩ	1.4 A ² s
0257003_	3 A	Purple	137 mV	31.1 mΩ	7.4 A ² s
0257004_	4 A	Pink	136 mV	22.8 mΩ	14 A ² s
0257005_	5 A	Brown	128 mV	17.85 mΩ	26 A ² s
025707.5_	7.5 A	Dark Brown	116 mV	10.91 mΩ	60 A ² s
0257010_	10 A	Red	109 mV	7.70 mΩ	115 A ² s
0257015_	15 A	Blue	102 mV	4.80 mΩ	340 A ² s
0257020_	20 A	Yellow	98 mV	3.38 mΩ	520 A ² s
0257025_	25 A	White	92 mV	2.52 mΩ	1080 A ² s
0257030_	30 A	Green	84 mV	1.97 mΩ	1510 A ² s
0257035_	35 A	Light Green	87 mV	1.61 mΩ	2280 A ² s
0257040_	40 A	Orange	96 mV	1.44 mΩ	3310 A ² s

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.
 Corresponding holder see Section "Fuse Holders."

ATO® Blade Fuse Rated 32V

Dimensions in mm / Maße in mm



Blade Fuses

See Section Specialty Products for Resistors, Diodes, and Shunts.

FKS ATO® Style Blade Fuse Rated 32V

RoHS

Blade Fuses



Specifications

DIN 72581-3C
ISO 8820-3

Insulating body: Out of thermoplastic (UL 94-V0, heat-resistant)
Cover: Out of thermoplastic (V0, transparent),
Visible melting-element
Shunt: red, not transparent

Connections: Blade contacts
Copper alloy, gal. Sn
Edge-protected

Breaking capacity: 1,000 A, 32 VDC

The FKS-32 is an ATO style blade fuse rated at 32V, featuring a three part construction with copper contacts for excellent reliability in harsh environment conditions and low voltage drop. Current ratings 0.5A thru 40A. With see-through cover for easy detection of blown fuses.

FSK-32 ist eine ATO-Flachstecksicherung mit 32V Nennspannung. Merkmale sind dreiteiliger Aufbau mit Kupferkontakten, niedriger Spannungsabfall und hohe Zuverlässigkeit unter rauen Umgebungsbedingungen. Nennstrom 0,5A bis 40A, transparente Abdeckung zur leichten Erkennung durchgebrannter Sicherungen.

Time-Current Characteristics / Schmelzeit-Grenzwerte

% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
110	100 h / –
135	750 ms / 1,800 s
200	150 ms / 5 s
350	40 ms / 500 ms
600	20 ms / 100 ms

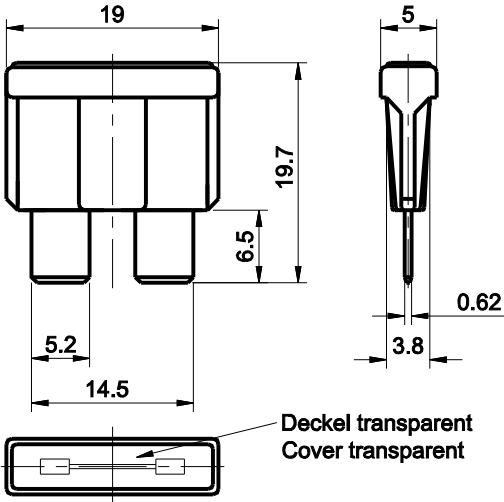
Part Number Artikel-Nr.	Current Rating Nennstrom	Housing Color Kennfarbe	Typ. Voltage Drop Typ. Spannungsfall		Cold Resistance Kaltwiderstand	I ² t
			Standard DIN max.	Littelfuse max.		
162.6185.350_	0.5 A*		–	320 mV	450 mΩ	0.70 A ² s
162.6185.410_	1 A		–	150 mV	108 mΩ	2.00 A ² s
162.6185.420_	2 A		–	130 mV	47.2 mΩ	8.00 A ² s
162.6185.430_	3 A		175 mV	140 mV	30.5 mΩ	15.0 A ² s
162.6185.440_	4 A		175 mV	120 mV	22.5 mΩ	25.0 A ² s
162.6185.450_	5 A		175 mV	145 mV	16.5 mΩ	35.0 A ² s
162.6185.475_	7.5 A		150 mV	115 mV	11.5 mΩ	60.0 A ² s
164.6185.510_	10 A		125 mV	95 mV	6.80 mΩ	110 A ² s
164.6185.515_	15 A		125 mV	90 mV	4.50 mΩ	250 A ² s
164.6185.520_	20 A		125 mV	90 mV	3.40 mΩ	648 A ² s
164.6185.525_	25 A		110 mV	80 mV	2.50 mΩ	600 A ² s
164.6185.530_	30 A		100 mV	80 mV	1.85 mΩ	1,070 A ² s
162.6185.535_	35 A*		100 mV	75 mV	1.50 mΩ	1,600 A ² s
162.6185.540_	40 A*		100 mV	100 mV	1.35 mΩ	2,000 A ² s
160.6185.000_	Shunt*		–	42 mV	0.73 mΩ	9,000 A ² s

* Not mentioned in the standards

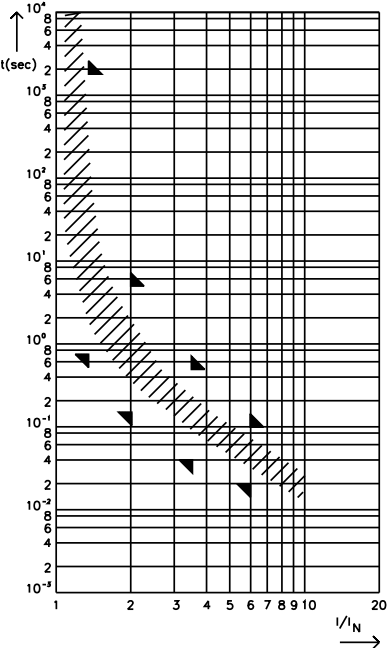
Last figure of part number = packaging code, see Section "Packaging Index," pg. 157. Corresponding holder see Section "Fuse Holders."

FKS ATO® Style Blade Fuse Rated 32V

Dimensions in mm / Maße in mm



Pre-arcing Time - limits / Schmelzeit-Grenzwerte DIN



FI = 1.33 (max. operating current: 0.75 x I_{rat} at 23°C)

Blade Fuses

TAC ATO® Style Blade Fuse Rated 58V



Blade Fuses



Specifications

DIN 72581-3
 UL 248 Special Purpose Fuses
 cULus Recognized: File No. E211637

Insulating body: Out of thermoplastic (UL 94-V0, heat-resistant)
Cover: Out of thermoplastic (V0, transparent), Visible melting-element

Connections: Blade contacts
 Copper alloy, gal. Sn
 Edge-protected

Breaking capacity: 1,000 A, 58 VDC

The TAC is an ATO style blade fuse rated at 58V, featuring a three part construction with copper contacts for excellent reliability in harsh environment conditions and low voltage drop. Current ratings 1A thru 40A. With see-through cover for easy detection of blown fuses.

TAC ist eine ATO-Flachstecksicherung mit 58V Nennspannung. Merkmale sind dreiteiliger Aufbau mit Kupferkontakten, niedriger Spannungsabfall und hohe Zuverlässigkeit unter rauen Umgebungsbedingungen. Nennstrom 1A bis 40A, transparente Abdeckung zur leichten Erkennung durchgebrannter Sicherungen.

Time-Current Characteristics / Schmelzeit-Grenzwerte

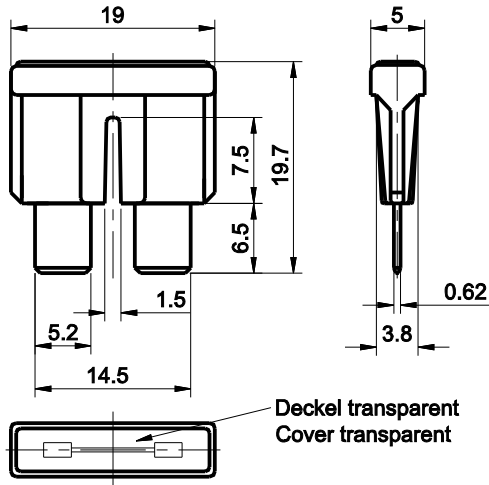
% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
110	100 h / –
135	750 ms / 1,800 s
200	150 ms / 5 s
350	40 ms / 500 ms
600	20 ms / 100 ms

Part Number Artikel-Nr.	Current Rating Nennstrom	Housing Color Kennfarbe	Typ. Voltage Drop Typ. Spannungsfall		Cold Resistance Kaltwiderstand	I ² t
			Standard DIN max.	Littelfuse max.		
142.6185.410_	1 A	Black	–	150 mV	108 mΩ	2.00 A ² s
142.6185.420_	2 A	Grey	–	130 mV	45.0 mΩ	8.00 A ² s
142.6185.430_	3 A	Purple	175 mV	140 mV	28.5 mΩ	15.0 A ² s
142.6185.440_	4 A	Pink	175 mV	120 mV	22.5 mΩ	25.0 A ² s
142.6185.450_	5 A	Brown	175 mV	145 mV	16.5 mΩ	35.0 A ² s
142.6185.475_	7.5 A	Dark Brown	150 mV	115 mV	11.5 mΩ	60.0 A ² s
142.6185.510_	10 A	Red	125 mV	95 mV	6.80 mΩ	115 A ² s
142.6185.515_	15 A	Blue	125 mV	90 mV	4.30 mΩ	250 A ² s
142.6185.520_	20 A	Yellow	125 mV	90 mV	3.10 mΩ	600 A ² s
142.6185.525_	25 A	White	100 mV	80 mV	2.30 mΩ	600 A ² s
142.6185.530_	30 A	Green	100 mV	80 mV	1.90 mΩ	1,070 A ² s
142.6185.540_	40 A	Orange	100 mV	100 mV	1.40 mΩ	2,000 A ² s

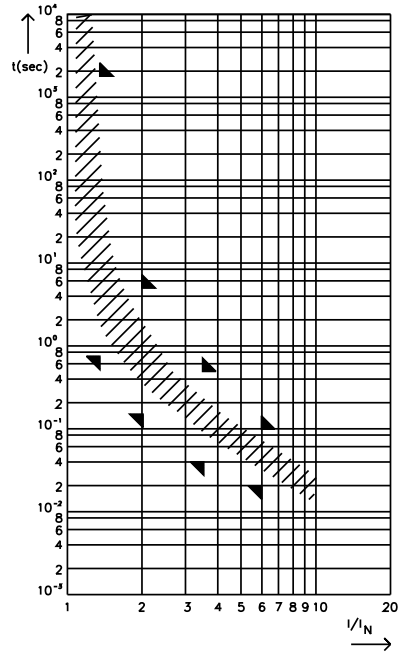
Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.
 Corresponding holder see Section "Fuse Holders."

TAC ATO® Style Blade Fuse Rated 58V

Dimensions in mm / Maße in mm



Pre-arcing Time - limits / Schmelzzeit-Grenzwerte DIN



FI = 1.33 (max. operating current: 0.75 x I_{rat} at 23°C)

FKS ATO® Style Blade Fuse Rated 80V



Blade Fuses



Specifications

- LWS
 UL 248 Special Purpose Fuses
 cULus Recognized: File No. E211637
- Insulating body:** Out of thermoplastic (UL 94-V0, heat-resistant)
Cover: Out of thermoplastic V0
 Red, not transparent
- Connections:** Blade contacts
 Copper alloy, gal. Sn
 Edge-protected
- Breaking capacity:** 1,000 A, 80 VDC

The FKS-80 is an ATO style blade fuse rated at 80V, featuring a three part construction with copper contacts for excellent reliability in harsh environment conditions and low voltage drop. Current ratings 3A thru 30A. Filled with arc-quenching material.

FKS-80 ist eine ATO-Flachstecksicherung mit 80V Nennspannung. Merkmale sind dreiteiliger Aufbau mit Kupferkontakten, niedriger Spannungsabfall und hohe Zuverlässigkeit unter rauen Umgebungsbedingungen. Nennstrom 3A bis 30A. Gefüllt mit Lichtbogen löschendem Material.

Time-Current Characteristics / Schmelzeit-Grenzwerte

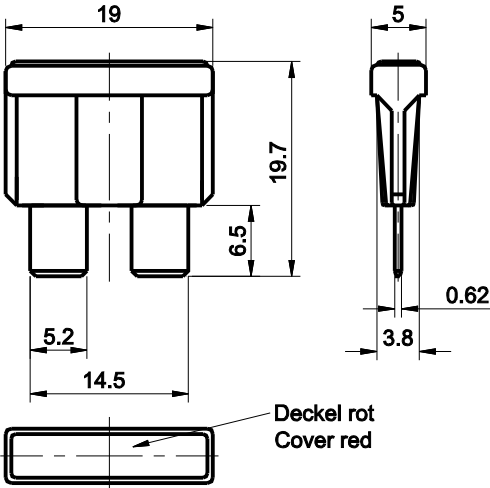
% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
110	100 hrs / –
135	500 ms / 300 s
200	150 ms / 20 s
350	40 ms / 500 ms
600	20 ms / 100 ms

Part Number Artikel-Nr.	Current Rating Nennstrom	Housing Color Kennfarbe	Typ. Voltage Drop Typ. Spannungsfall	Cold Resistance Kaltwiderstand	I ² t
166.7000.430_	3 A		145 mV	39.0 mΩ	8.10 A ² s
166.7000.440_	4 A		140 mV	29.0 mΩ	14.4 A ² s
166.7000.450_	5 A		140 mV	20.6 mΩ	24.3 A ² s
166.7000.475_	7.5 A		120 mV	11.5 mΩ	44.5 A ² s
166.7000.510_	10 A		110 mV	7.90 mΩ	86.4 A ² s
166.7000.515_	15 A		110 mV	4.60 mΩ	162 A ² s
166.7000.520_	20 A		110 mV	3.30 mΩ	475 A ² s
166.7000.525_	25 A		105 mV	2.27 mΩ	950 A ² s
166.7000.530_	30 A		100 mV	1.79 mΩ	1,500 A ² s

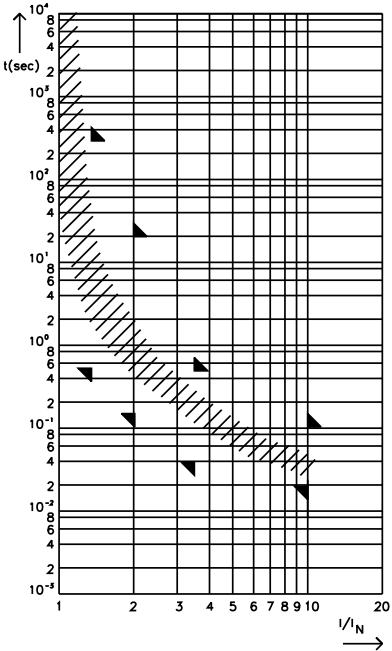
Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.
 Corresponding holder see Section "Fuse Holders."

FKS ATO® Style Blade Fuse Rated 80V

Dimensions in mm / Maße in mm



Pre-arcing Time - limits / Schmelzzeit-Grenzwerte DIN



FI = 1.43 (max. operating current: 0.7 x I_{rat} at 23°C)

Blade Fuses

TF ATO® Style Blade Fuse Rated 90V

RoHS

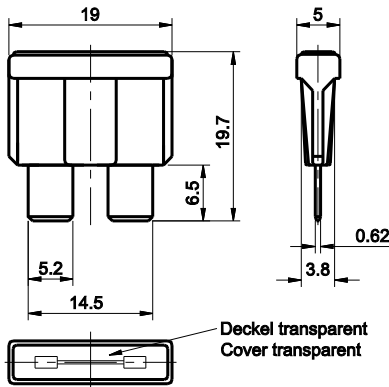
Blade Fuses



The TF is an ATO style blade fuse rated at 90V, featuring a three part construction with copper contacts for excellent reliability in harsh environment conditions and low voltage drop. Current ratings 4A thru 15A. With see-through cover for easy detection of blown fuses.

TF ist eine ATO-Flachstecksicherung mit 90V Nennspannung. Merkmale sind dreiteiliger Aufbau mit Kupferkontakten, niedriger Spannungsabfall und hohe Zuverlässigkeit unter rauen Umgebungsbedingungen. Nennstrom 4A bis 15A, transparente Abdeckung zur leichten Erkennung durchgebrannter Sicherungen.

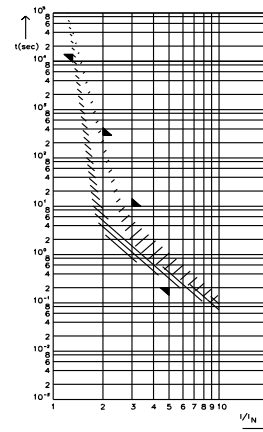
Dimensions in mm / Maße in mm



Specifications

- Insulating body:** Out of thermoplastic (UL 94-V0, heat-resistant)
- Cover:** Out of thermoplastic V0 (heat-resistant)
Visible melting element
- Connections:** Blade contacts
Copper alloy, gal. Sn
Edge-protected
- Test cable:** 4 mm²
- Packaging unit:** 2,000 pieces

Pre-arcing Time - limits / Schmelzeit-Grenzwerte DIN



Time-Current Characteristics / Schmelzeit-Grenzwerte

% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
110	4 h / -
200	4 h / - - / 300 s
300	- / 10 s
500	- / 10 s 200 ms / - 200 ms / -

Part Number Artikel-Nr.	Current Rating Nennstrom	Housing Color Kennfarbe	Typ. Voltage Drop Typ. Spannungsfall	Cold Resistance Kaltwiderstand	I ² t
162.7049.4402	4 A		115 mV	19.4 Ω	> 100 A ² s
162.7049.4802	8 A		80 mV	7.50 Ω	> 300 A ² s
162.7049.5102	10 A		70 mV	6.10 Ω	> 580 A ² s
162.7049.5152	15 A		65 mV	3.50 Ω	> 1,700 A ² s

Remark: TF-fuse links are back-up fuse links, see minimum fault current.
Corresponding holder see Section "Fuse Holders."

MAXI™ Blade Fuse Rated 32V

RoHS



Specifications

DIN 72581-3E

SAE J888

ISO 8820

Voltage Rating:

32 VDC

Interrupting Ratings:

1000A @ 32 VDC

Operating Temperature Range:










-40°C to +125°C

The MAXI fuse uses “Diffusion Pill Technology” to provide predictable time delay characteristic and low heat dissipation. Current rating 20A – 80A, 32 VDC.

Die MAXI-Sicherung basiert auf einer speziellen Diffusionstechnologie (Diffusionspille) und zeichnet sich durch eine genau definierte Verzögerungscharakteristik und geringe Wärmeabgabe aus. Nennstrom 20A bis 80A, 32 VDC.

Time-Current Characteristics / Schmelzeit-Grenzwerte

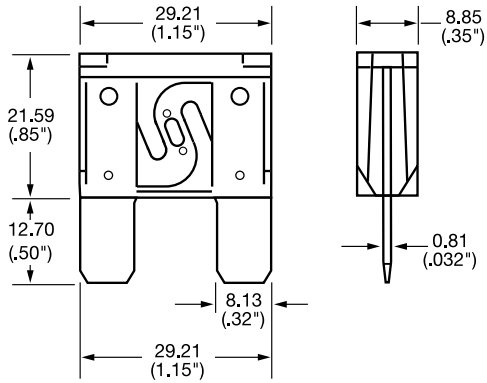
% of Rating % des Nennstromes	Opening Time Min / Max (s) / Schmelzcharakteristik Min / Max (s)								
	20A	25A	30A	35A	40A	50A	60A	70A	80A
135	1800	1800	1800	1800	1800	1800	1800	3600	3600
	60	60	60	60	60	60	60	60	60
200	20	30	30	40	40	50	60	60	60
	4	4	6	6	8	10	15	4	4
350	2	4	4	5	5	6	7	2	2
	0.7	0.7	1	1	1.4	1.7	2	0.20	0.20
600	1	1	1	1	1	1	1	1	1
	0.15	0.15	0.20	0.20	0.20	0.20	0.20	.1	.1

Part Number Artikel-Nr.	Current Rating Nennstrom	Housing Color Kennfarbe	Typ. Voltage Drop Typ. Spannungsfall	Cold Resistance Kaltwiderstand	I ² t
0299020_	20 A		76 mV	3.10 mΩ	1100 A ² s
0299025_	25 A		75 mV	2.39 mΩ	2087 A ² s
0299030_	30 A		77 mV	1.95 mΩ	4070 A ² s
0299035_	35 A		75 mV	1.71 mΩ	6032 A ² s
0299040_	40 A		75 mV	1.42 mΩ	8450 A ² s
0299050_	50 A		73 mV	1.10 mΩ	11300 A ² s
0299060_	60 A		77 mV	0.89 mΩ	15300 A ² s
0299070_	70 A		61 mV	0.64 mΩ	6900 A ² s
0299080_	80 A		62 mV	0.54 mΩ	8800 A ² s

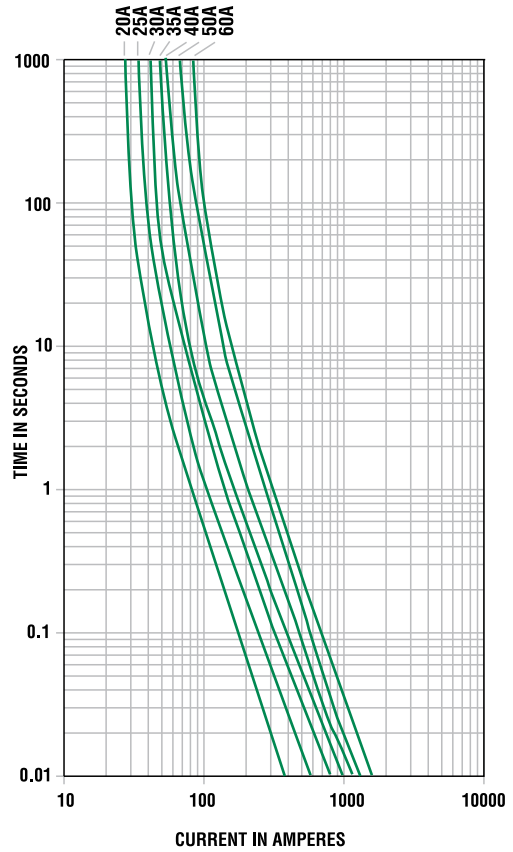
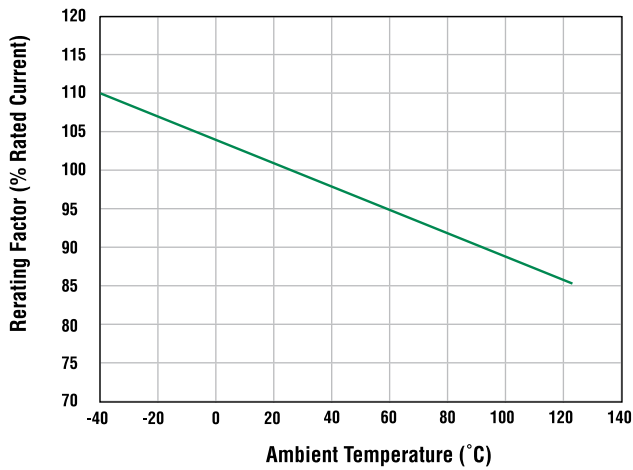
Last figure of part number = packaging code, see Section “Packaging Index,” pg. 157.
Corresponding holder see Section “Fuse Holders.”

MAXI™ Blade Fuse Rated 32V

Dimensions in mm / Maße in mm



MAXI Fuse Temperature Rerating Curve



FK3 MAXI™ Style Blade Fuse Rated 32V

RoHS


Specifications

DIN 72581/3E

SAE J 1888

ISO 8820-3

UL 248 Special Purpose Fuses

Insulating body: Out of thermoplastic (UL 94-V0, heat-resistant)**Cover:** Out of thermoplastic (V0, transparent),

Visible melting-element

Connections: Blade contacts

Copper alloy, gal. Sn

Edge-protected

Breaking capacity: 1,000 A, 32 V, DC











Standard DIN voltage drop form 80A: 100mV

The FK3 32V automotive standard fuse link in MAXI size. Three part construction with copper contacts for excellent reliability in harsh environment conditions with low voltage drop. Current ratings 20A thru 100A. With see-through cover for easy detection of blown fuses.

Die FK1 32V-Standardsicherung in MAXI-Bauform. Merkmale sind dreiteiliger Aufbau mit Kupferkontakten, niedriger Spannungsabfall und hohe Zuverlässigkeit unter rauen Umgebungsbedingungen. Nennstrom 20A bis 100A, transparente Abdeckung zur leichten Erkennung durchgebrannter Sicherungen.

Time-Current Characteristics / Schmelzeit-Grenzwerte

% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
110	100 h / –
	100 h / –
135	60 s / 1,800 s
	– / –
200	2 s / 60 s
	2 s / 60 s
350	200 ms / 7 s
	200 ms / 7 s
600	40 ms / 1 s
	40 ms / 1 s

Part Number Artikel-Nr.	Current Rating Nennstrom	Housing Color Kennfarbe	Typ. Voltage Drop Typ. Spannungsfall		Cold Resistance Kaltwiderstand	I ² t
			Standard DIN max.	Littelfuse max.		
169.6885.520_	20 A		125 mV	95 mV	3.80 mΩ	1,900 A ² s
169.6885.525_	25 A*		–	100 mV	2.80 mΩ	2,300 A ² s
169.6885.530_	30 A		100 mV	80 mV	2.10 mΩ	6,000 A ² s
169.6885.535_	35 A*		–	100 mV	1.70 mΩ	8,400 A ² s
169.6885.540_	40 A		100 mV	85 mV	1.60 mΩ	12,000 A ² s
169.6885.550_	50 A		100 mV	80 mV	1.20 mΩ	26,000 A ² s
169.6885.560_	60 A		100 mV	85 mV	0.90 mΩ	45,000 A ² s
169.6885.570_	70 A		100 mV	90 mV	0.80 mΩ	70,000 A ² s
169.6885.580_	80 A		–	75 mV	0.72 mΩ	94,000 A ² s
169.6885.610_	100 A*		–	95 mV	0.50 mΩ	140,000 A ² s

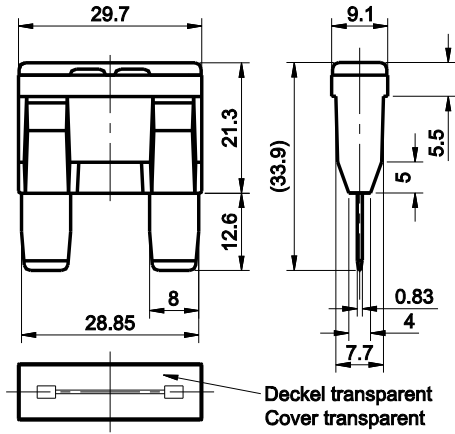
* Not mentioned in the standards

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.

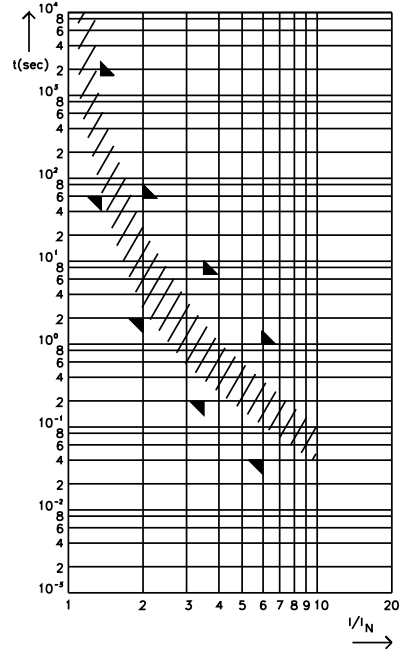
Corresponding holder see Section "Fuse Holders."

FK3 MAXI™ Style Blade Fuse Rated 32V

Dimensions in mm / Maße in mm



Pre-arcing Time - limits / Schmelzeit-Grenzwerte DIN



FI = 1.33 (max. operating current: 0.75 x I_{rat} at 23°C)

MAXI™ Blade Fuse Rated 58V

RoHS



Specifications










Voltage rating:	42 VDC
Interrupting Ratings:	1000A @ 58 VDC
Operating Temperature Range:	-40°C to +125°C

- Same performance characteristics as the industry standard MAXI, but modified to work in the 42V environment
- Rejection feature prevents lower rated fuses from being wrongfully inserted into the circuit
- Backwards compatibility with 12V circuits
- Based on proven technology
- Mates with industry standard terminals

- Gleiche Performance-Eigenschaften wie Standard-MAXI-Sicherung, jedoch für Betrieb in 42V Systemen modifiziert
- Sperrfunktion verhindert versehentliche Verwendung von Sicherungen mit niedrigerer Nennspannung
- Abwärtskompatibel mit 12V Schaltkreisen
- Bewährte Technologie
- Für Anschlüsse nach Industriestandard ausgelegt

Time-Current Characteristics / Schmelzeit-Grenzwerte

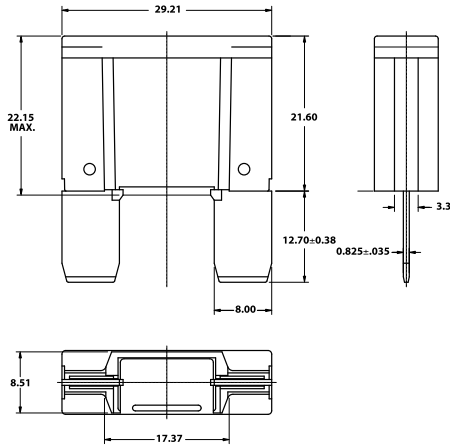
% of Rating % des Nennstromes	Opening Time Min / Max (s) / Schmelzcharakteristik Min / Max (s)								
	20A	25A	30A	35A	40A	50A	60A	70A	80A
135	1800	1800	1800	1800	1800	1800	1800	3600	3600
	60	60	60	60	60	60	60	60	60
200	20	30	30	40	40	50	60	60	60
	4	4	6	6	8	10	15	4	4
350	2	4	4	5	5	6	7	2	2
	0.7	0.7	1	1	1.4	1.7	2	0.20	0.20
600	1	1	1	1	1	1	1	1	1
	0.15	0.15	0.20	0.20	0.20	0.20	0.20	.1	.1

Part Number Artikel-Nr.	Current Rating Nennstrom	Housing Color Kennfarbe	Typ. Voltage Drop Typ. Spannungsfall	Cold Resistance Kaltwiderstand	I ² t
0999020_	20 A		76 mV	3.10 mΩ	1100 A²s
0999025_	25 A		75 mV	2.39 mΩ	2087 A²s
0999030_	30 A		77 mV	1.95 mΩ	4070 A²s
0999035_	35 A		75 mV	1.71 mΩ	6032 A²s
0999040_	40 A		75 mV	1.42 mΩ	8450 A²s
0999050_	50 A		70 mV	1.10 mΩ	11300 A²s
0999060_	60 A		66 mV	0.89 mΩ	15300 A²s
0999070_	70 A		61 mV	0.64 mΩ	6900 A²s
0999080_	80 A		62 mV	0.54 mΩ	8800 A²s

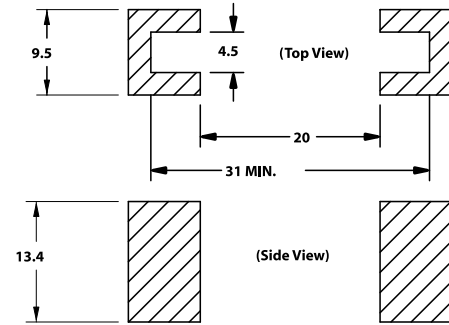
Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.
Corresponding holder see Section "Fuse Holders."

MAXI™ Blade Fuse Rated 58V

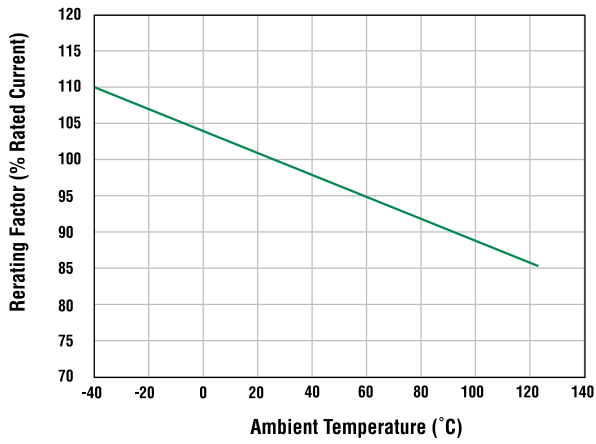
Dimensions in mm / Maße in mm



Recommended Mating Cavity



MAXI Fuse Temperature Rerating Curve



TOE MAXI™ Style Blade Fuse Rated 58V



Specifications

DIN 72581-3

UL 248 Special Purpose Fuses

cULus Recognized: File No. E211637

Insulating body: Out of thermoplastic (UL 94-V0, heat-resistant)

Cover: Out of thermoplastic (V0, transparent),
Visible melting-element

Connections: Blade contacts
Copper alloy, gal, Sn / alliage cuivreux, gal. Sn
Edge-protected

Breaking capacity: 1,000 A, 58 VDC







Packaging unit: 1,000 pieces

The TOE is a MAXI style fuse rated at 58V, featuring three piece design with copper contacts for excellent reliability in harsh environment conditions and low voltage drop. Current ratings 20A thru 70A. With see-through cover for easy detection of blown fuses.

TOE ist eine Sicherung in MAXI-Bauform mit 58V Nennspannung. Merkmale sind dreiteiliger Aufbau mit Kupferkontakten, niedriger Spannungsabfall und hohe Zuverlässigkeit unter rauen Umgebungsbedingungen. Nennstrom 20A bis 70A, transparente Abdeckung zur leichten Erkennung durchgebrannter Sicherungen.

Time-Current Characteristics / Schmelzeit-Grenzwerte

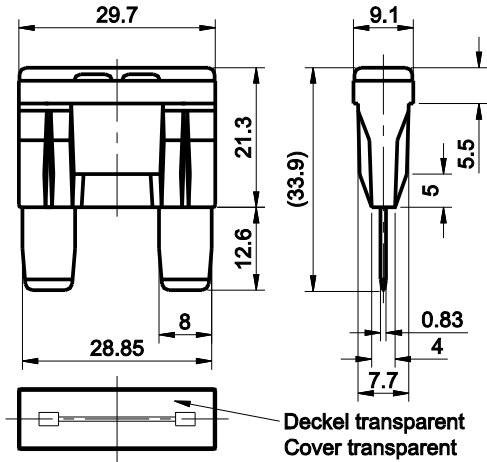
% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
110	100 h / –
135	60 s / 1,800 s
200	2 s / 60 s
350	200 ms / 7 s
600	40 ms / 1 s

Part Number Artikel-Nr.	Current Rating Nennstrom	Housing Color Kennfarbe	Typ. Voltage Drop Typ. Spannungsfall		Cold Resistance Kaltwiderstand	I ² t
			Standard DIN max.	Littelfuse max.		
142.6885.5202	20 A		125 mV	110 mV	3.70 mΩ	1,900 A ² s
142.6885.5302	30 A		100 mV	100 mV	2.20 mΩ	6,000 A ² s
142.6885.5402	40 A		100 mV	80 mV	1.60 mΩ	12,000 A ² s
142.6885.5502	50 A		100 mV	85 mV	1.20 mΩ	26,000 A ² s
142.6885.5602	60 A		100 mV	85 mV	0.90 mΩ	45,000 A ² s
142.6885.5702	70 A		100 mV	80 mV	0.80 mΩ	70,000 A ² s

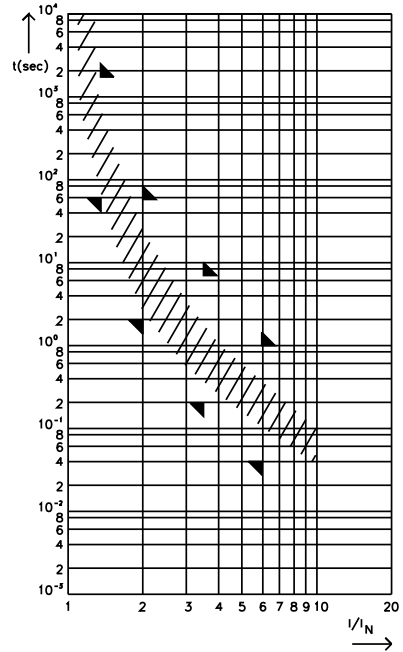
Corresponding holder see Section "Fuse Holders."

TOE MAXI™ Style Blade Fuse Rated 58V

Dimensions in mm / Maße in mm



Pre-arcing Time - limits / Schmelzzeit-Grenzwerte DIN



FI = 1.33 (max. operating current: 0.75 x I_{rat} at 23°C)

FK3 MAXI™ Style Blade Fuse Rated 80V



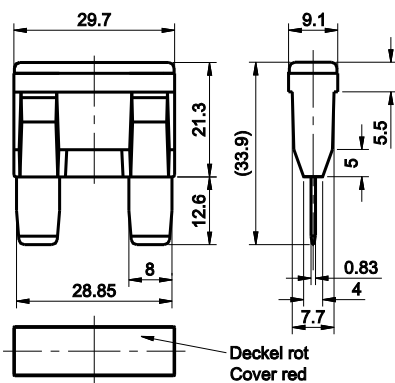
Specifications

- LWS
- UL 248 Special Purpose Fuses
- cULus Recognized: File No. E211637
- Insulating body:** Out of thermoplastic (UL 94-V0, heat-resistant)
- Cover:** Out of thermoplastic V0
Red, not transparent
- Connections:** Blade contacts
Copper alloy, gal. Sn
Edge-protected
- Breaking capacity:** 1,000 A, 80 V, DC
- Packaging unit:** 10 pieces

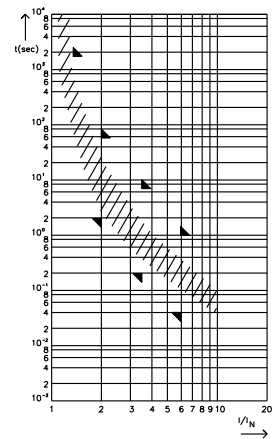
The FK3-80 is a MAXI style fuse rated at 80V, featuring three piece design with copper contacts for excellent reliability in harsh environment conditions and low voltage drop. Current ratings 20A thru 50A. Filled with arc-quenching material.

FK3-80 ist eine Sicherung in MAXI-Bauform mit 80V Nennspannung. Merkmale sind dreiteiliger Aufbau mit Kupferkontakten, niedriger Spannungsabfall und hohe Zuverlässigkeit unter rauen Umgebungsbedingungen. Nennstrom 20A bis 50A. Gefüllt mit Lichtbogen löschendem Material.

Dimensions in mm / Maße in mm



Pre-arcing Time - limits / Schmelzeit-Grenzwerte DIN



FI = 1.43 (max. operating current : $0.7 \times I_{rat}$ at 23°C)

Time-Current Characteristics / Schmelzeit-Grenzwerte

% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
110	100 h /
135	- / 1,800 s
200	2 s / 60 s
350	200 ms / 7 s
600	40 ms / 1 s

Part Number Artikel-Nr.	Current Rating Nennstrom	Housing Color Kennfarbe	Typ. Voltage Drop Typ. Spannungsfall	Cold Resistance Kaltwiderstand	I ² t
166.6885.5201	20 A		120 mV	4.50 mΩ	2,160 A ² s
166.6885.5301	30 A		160 mV	3.00 mΩ	4,950 A ² s
166.6885.5401	40 A		110 mV	1.65 mΩ	12,800 A ² s
166.6885.5501	50 A		100 mV	1.20 mΩ	25,500 A ² s

Corresponding holder see Section "Fuse Holders."

Cartridge Fuses



<i>Low Profile JCASE® Fuse Rated 58V</i>	61
<i>JCASE® Fuse Rated 32V</i>	62
<i>JCASE® Fuse Rated 58V</i>	64

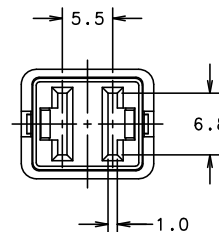
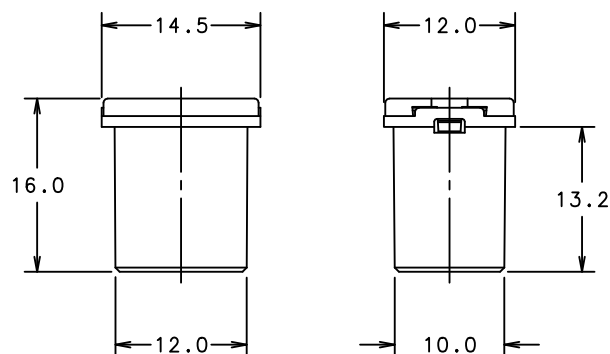
Low Profile JCASE® Fuses Rated 58V

RoHS



Specifications

Voltage Rating: 58 VDC
Interrupting Ratings: 1000A @ 32 VDC
Operating Temperature Range: -40°C to +125°C
Insertion Force:
Extraction Force:



The Low Profile JCASE fuse has similar performance characteristics as the standard JCASE fuse. The lower overall height reduction allows for more space and weight savings and also allows for a shorter male blade terminal, saving additional weight and material savings in fuse box designs.

Die Low-Profile-JCASE-Sicherung bietet ähnliche Leistungsmerkmale wie die Standard-JCASE-Sicherung. Ihre geringere Gesamthöhe ermöglicht Platz- und Gewichtseinsparungen sowie die Verwendung kürzerer Flachstecker, so dass zusätzliche Gewichts- und Materialeinsparungen beim Entwurf von Sicherungskästen erzielt werden können.

Time-Current Characteristics / Schmelzzeit-Grenzwerte

% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
110	100 h / -
135	60 s / 1800 s
200	4 s / 60 s
350	200 ms / 7 s
600	40 ms / 1 s

Part Number Artikel-Nr.	Current Rating Nennstrom	Housing Color Kennfarbe	Cold Resistance Kaltwiderstand	Pt
0895020_	20 A	Blue	4.48 mΩ	A ² s
0895025_	25 A	White	3.39 mΩ	A ² s
0895030_	30 A	Pink	2.68 mΩ	A ² s
0895040_	40 A	Green	1.89 mΩ	A ² s
0895050_	50 A	Red	1.08 mΩ	A ² s
0895060_	60 A	Yellow	0.83 mΩ	A ² s

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.
Corresponding holder see Section "Fuse Holders."

JCASE® Cartridge Fuse Rated 32V

RoHS

Cartridge Fuses



Specifications

Voltage Rating:	32 VDC
Interrupting Ratings:	1000A @ 32 VDC
Operating Temperature Range:	-40°C to + 125°C
Insertion Force:	53N max. (12 lb.)
Extraction Force:	9N min. (2 lb.)

The JCASE is a cartridge style fuse with female terminal design. JCASE provides both increased time delay and low voltage drop to protect high current circuits. JCASE has the ability to handle inrush currents. The JCASE was designed and patented by Littelfuse.

JCASE® ist eine von Littelfuse entwickelte und patentierte Patronensicherung mit Buchsenanschlüssen. Mit größerer Zeitverzögerung, niedrigem Spannungsabfall und besserer Festigkeit gegenüber Einschaltströmen eignet sie sich besonders für Schaltkreise mit hohen Strömen.

Time-Current Characteristics / Schmelzeit-Grenzwerte

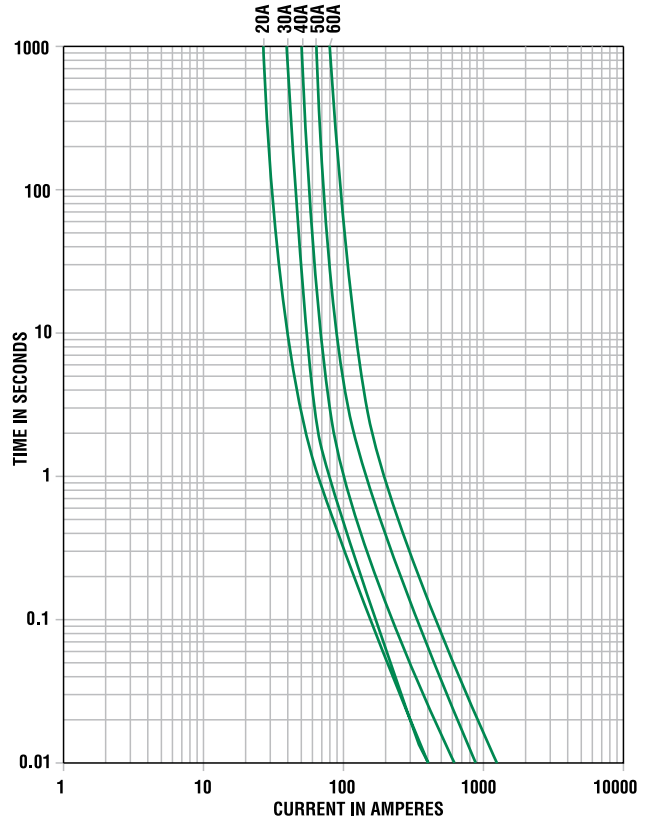
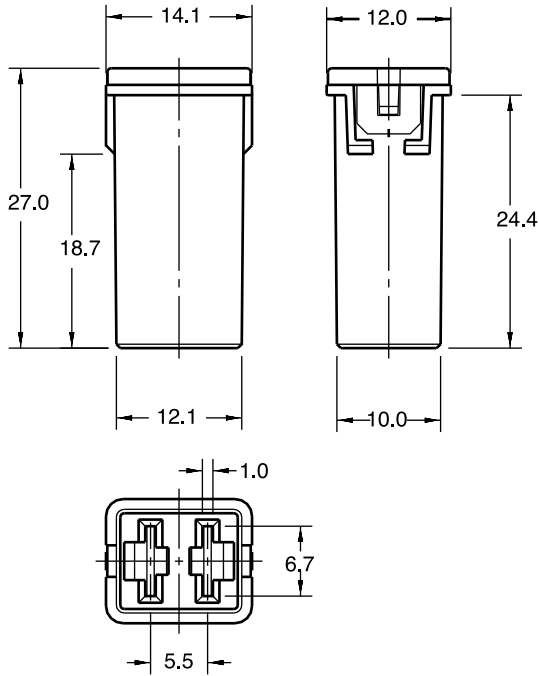
% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
110	100 h / –
135	60 s / 1800 s
200	4 s / 60 s
350	200 ms / 7 s
600	40 ms / 1 s

Part Number Artikel-Nr.	Current Rating Nennstrom	Housing Color Kennfarbe	Typ. Voltage Drop Typ. Spannungsfall	Cold Resistance Kaltwiderstand	I ² t
0495020_	20 A		106 mV	4.29 mΩ	1750 A²s
0495025_	25 A		101 mV	3.28 mΩ	3220 A²s
0495030_	30 A		91 mV	2.12 mΩ	1480 A²s
0495040_	40 A		87 mV	1.30 mΩ	3650 A²s
0495050_	50 A		88 mV	0.99 mΩ	8750 A²s
0495060_	60 A		87 mV	0.76 mΩ	19500 A²s

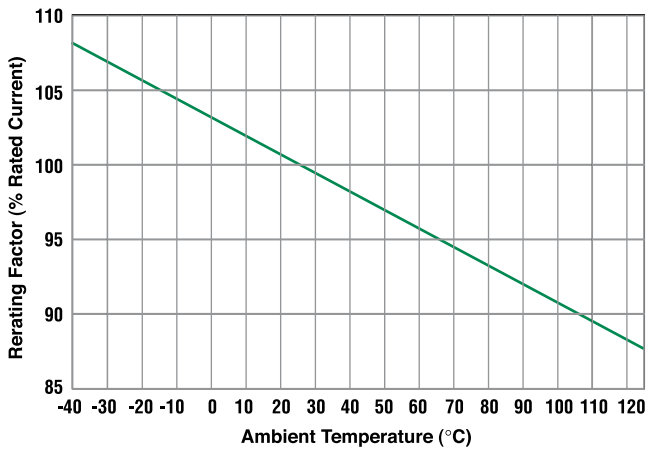
Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.
Corresponding holder see Section "Fuse Holders."

JCASE® Cartridge Fuse Rated 32V

Dimensions in mm / Maße in mm



JCASE Fuse Series Temperature Derating Curve



Cartridge Fuses

See Section Specialty Products for JCASE® Shunt

JCASE® Cartridge Fuse Rated 58V

RoHS



Specifications

Voltage Rating: 58 VDC
Interrupting Rating: 1000A @ 58 VDC
Operating Temperature Range: -40°C to +125°C
Insertion Force:
Extraction Force:

Cartridge Fuses

JCASE fuse for 42V PowerNet applications. Same Time-Current characteristic as the 32V JCASE fuse. Fits to standard JCASE fuse sockets. A rejection feature prevents fuses with lower voltage rating from being wrongfully inserted into the circuit. Current rating 20A – 60A, 58 VDC max.

JCASE-Sicherung für 42V PowerNet-Anwendungen haben die gleiche Zeit-Strom-Charakteristik wie die 32V JCASE-Sicherung. Die Sicherung passt in Standard-JCASE-Sicherungshalter und hat eine Sperrfunktion, die eine versehentliche Verwendung von Sicherungen mit niedrigerer Nennspannung verhindert. Nennstrom 20A bis 60A, 58 VDC max.

Time-Current Characteristics / Schmelzeit-Grenzwerte

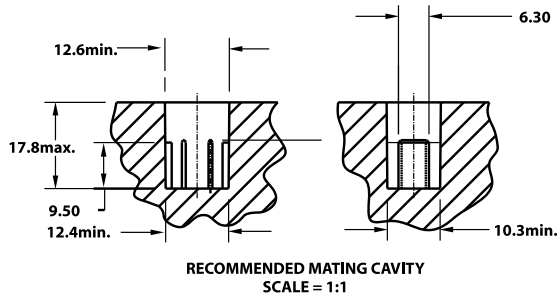
% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
110	100 h / –
135	60 s / 1800 s
200	4.0 s / 60.0 s
350	200 ms / 7.0 s
600	40 ms / 1.0 s

Part Number Artikel-Nr.	Current Rating Nennstrom	Housing Color Kennfarbe	Typ. Voltage Drop Typ. Spannungsfall	Cold Resistance Kaltwiderstand	I ² t
0995020_	20 A		106 mV	4.29 mΩ	1750 A²s
0995025_	25 A		101 mV	3.28 mΩ	3220 A²s
0995030_	30 A		91 mV	2.12 mΩ	1480 A²s
0995040_	40 A		87 mV	1.30 mΩ	3650 A²s
0995050_	50 A		88 mV	0.99 mΩ	8750 A²s
0995060_	60 A		87 mV	0.76 mΩ	19500 A²s

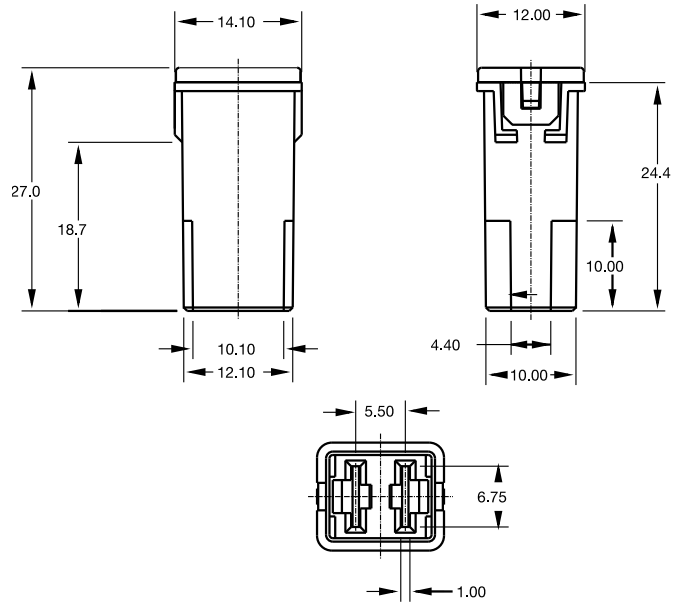
Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.
Corresponding holder see Section "Fuse Holders."

JCASE[®] Cartridge Fuse Rated 58V

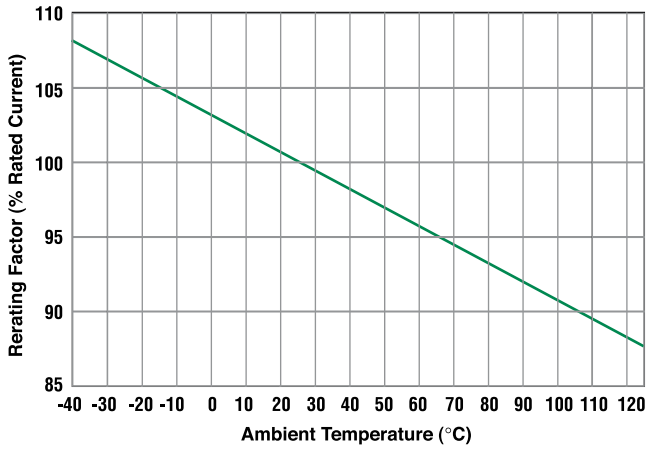
Recommended Mating Cavity



Dimensions in mm / Maße in mm



JCASE Fuse Series Temperature Derating Curve



Bolt-down Fuses



<i>BF1-Fuse Rated 32V</i>	67
<i>BF1-Fuse Rated 58V</i>	69
<i>MEGA® Fuse Rated 32V</i>	71
<i>Fuse Strip Rated 36V</i>	73
<i>Fuse Strip Rated 80V</i>	74
<i>HSB Fuse Rated 32V</i>	77
<i>Compact Fuse Rated 58V</i>	78

BF1 Fuse Rated 32V

RoHS



Specifications

- ISO 8820-5
- UL 248 Special Purpose Fuses
- Housing:** Out of thermoplastic (UL 94-V0, heat-resistant)
Visible melting element
- Connections:** Copper alloy, gal. Sn
2 x M5 or M6 bolts, distance 30 mm
- Starting torque:** 4.5 Nm +/- 1Nm
- Breaking capacity:** 30A - 150A: 2,000A, 32 VDC
200A: 1,500A, 32 VDC

The BF1-32 fuse is rated at 32V and offers a bolt-on fuse for high current wiring protection. Current rating 30A - 200A; with transparent housing for easy detection of blown fuses.

BF1-32 ist eine Schraubsicherung mit 32V Nennspannung zum Schutz von Hochstrom-Verdrahtungen. Nennstrom 30A bis 200A, transparente Abdeckung zur leichten Erkennung durchgebrannter Sicherungen.

Time-Current Characteristics / Schmelzeit-Grenzwerte

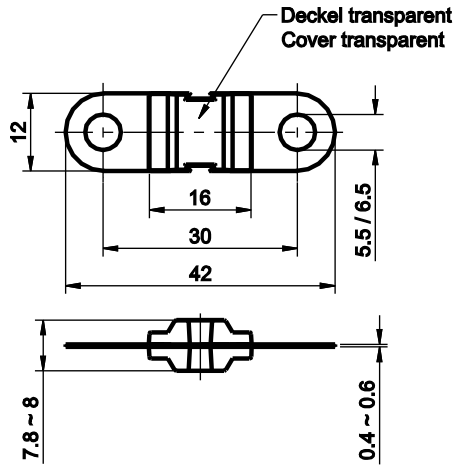
% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
75 (200A)	100 h / -
100 (30A-150A)	100 h / -
110 (30A-150A)	14,400 s / -
150 (30A-150A)	300 s / 3,600 s
200 (30A-150A)	3 s / 300 s
200 (200A)	1 s / 15 s
300 (30A-150A)	300 ms / 3 s
350 (200A)	300 ms / 5 s
500 (30A-150A)	100 ms / 1 s
600 (200A)	100 ms / 1 s

Part Number Artikel-Nr.		Current Rating Nennstrom	Housing Color Kennfarbe	Typ. Voltage Drop Typ. Spannungsfall		Cold Resistance Kaltwiderstand	I ² t
M5	M6			Standard DIN max.	Littelfuse max.		
153.5631.530_	153.7010.530_	30 A		105 mV	105 mV	2.70 mΩ	5,100 A²s
153.5631.540_	153.7010.540_	40 A		90 mV	90 mV	1.56 mΩ	6,800 A²s
153.5631.550_	153.7010.550_	50 A		80 mV	80 mV	1.03 mΩ	6,900 A²s
153.5631.560_	153.7010.560_	60 A		80 mV	75 mV	0.75 mΩ	16,200 A²s
153.5631.570_	153.7010.570_	70 A		80 mV	70 mV	0.64 mΩ	22,000 A²s
153.5631.580_	153.7010.580_	80 A		75 mV	70 mV	0.55 mΩ	25,600 A²s
153.5631.610_	153.7010.610_	100 A		75 mV	70 mV	0.44 mΩ	42,500 A²s
153.5631.612_	153.7010.612_	125 A		75 mV	70 mV	0.34 mΩ	62,500 A²s
153.5631.615_	153.7010.615_	150 A		85 mV	70 mV	0.29 mΩ	83,400 A²s
153.5631.620_	153.7000.620_	200 A		85 mV	70 mV	0.24 mΩ	126,000 A²s

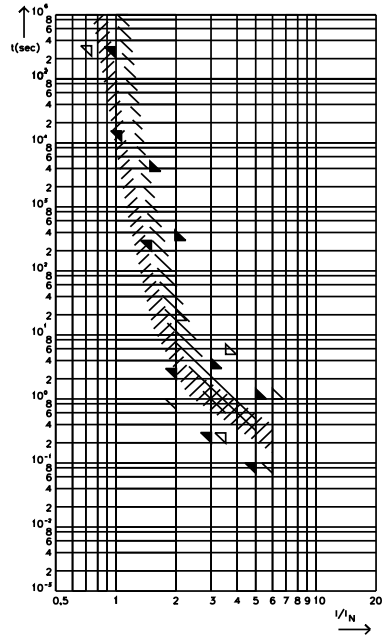
Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.
Corresponding holder see Section "Fuse Holders."

BF1 Fuse Rated 32V

Dimensions in mm / Maße in mm



Pre-arcing Time - limits / Schmelzzeit-Grenzwerte DIN



30 A - 150 A: FI = 1.25 (max. operating current: $0.8 \times I_{rat}$ at 23°C)

200 A: FI = 2.00 (max. operating current: $0.5 \times I_{rat}$ at 23°C)

BF1-Fuse Rated 58V

RoHS



Specifications

- ISO 8820-5
- UL 248 Special Purpose Fuses
- Housing:** Out of thermoplastic (UL 94-V0, heat-resistant)
Visible melting element
- Connections:** Copper alloy, gal. Sn
2 x M5 bolts, distance 30 mm
- Starting torque:** 4.5 Nm +/- 1Nm
- Breaking capacity:** 1,000A, 58 VDC
- Packaging unit:** 500 pieces

The BF1-58 fuse is rated at 58V and offers a bolt-on fuse for high current wiring protection. Current rating 30A - 200A; with transparent housing for easy detection of blown fuses.

BF1-58 ist eine Schraubsicherung mit 58V Nennspannung zum Schutz von Hochstrom-Verdrahtungen. Nennstrom 30A bis 200A, transparente Abdeckung zur leichten Erkennung durchgebrannter Sicherungen.

Time-Current Characteristics / Schmelzeit-Grenzwerte

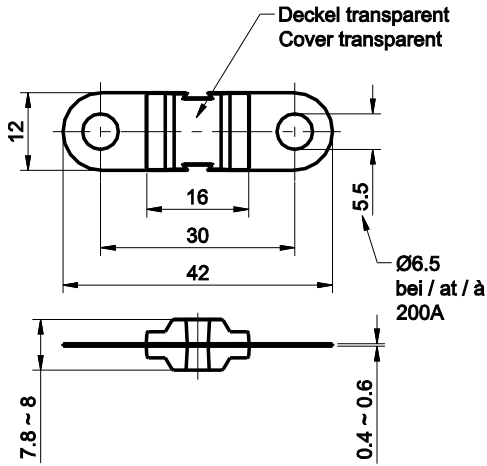
% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
75 (200A)	100 h / -
100 (30A-150A)	100 h / -
110 (30A-150A)	14,400 s / -
150 (30A-150A)	300 s / 3,600 s
200 (30A-150A)	3 s / 300 s
200 (200A)	1 s / 15 s
300 (30A-150A)	300 ms / 3 s
350 (200A)	300 ms / 5 s
500 (30A-150A)	100 ms / 1 s
600 (200A)	100 ms / 1 s

Part Number Artikel-Nr.	Current Rating Nennstrom	Housing Color Kennfarbe	Typ. Voltage Drop Typ. Spannungsfall		Cold Resistance Kaltwiderstand	I ² t
			Standard DIN max.	Littelfuse max.		
142.5631.5302	30 A		105 mV	105 mV	2.70 mΩ	5,100 A²s
142.5631.5402	40 A		90 mV	90 mV	1.56 mΩ	6,800 A²s
142.5631.5502	50 A		80 mV	80 mV	1.03 mΩ	6,900 A²s
142.5631.5602	60 A		80 mV	75 mV	0.75 mΩ	16,200 A²s
142.5631.5702	70 A		80 mV	70 mV	0.64 mΩ	22,000 A²s
142.5631.5802	80 A		75 mV	70 mV	0.55 mΩ	25,600 A²s
142.5631.6102	100 A		75 mV	70 mV	0.44 mΩ	42,500 A²s
142.5631.6122	125 A		75 mV	70 mV	0.34 mΩ	62,500 A²s
142.5631.6152	150 A		85 mV	70 mV	0.29 mΩ	83,400 A²s
142.5631.6202	200 A		85 mV	70 mV	0.24 mΩ	126,000 A²s

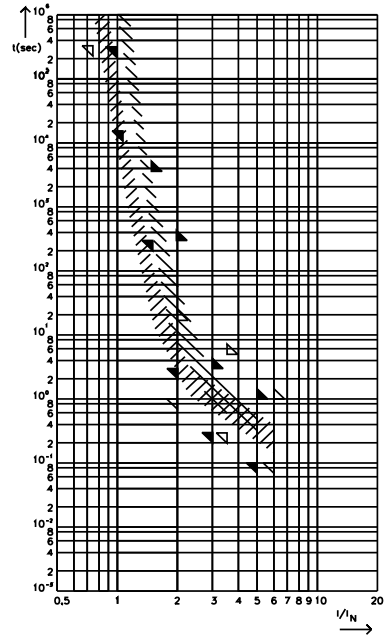
Corresponding holder see Section "Fuse Holders."

BF1-Fuse Rated 58V

Dimensions in mm / Maße in mm



Pre-arcing Time - limits / Schmelzeit-Grenzwerte DIN



40 A - 150 A: FI = 1.25 (max. operating current: $0.8 \times I_{rat}$ at 23°C)
200 A: FI = 2.00 (max. operating current: $0.5 \times I_{rat}$ at 23°C)

MEGA® Fuse Rated 32V

RoHS



Specifications

Interrupting Rating: 2000A @ 32 VDC
Voltage Rating: 32 VDC
Operating Temperature Range: 40°C to + 125°C

The MEGA Fuse is designed for high current circuit protection up to 500A with "Diffusion Pill Technology." The MEGA Fuse also provides time delay characteristics. Designed and patented by Littelfuse, the MEGA Fuse is ideal for battery and alternator protection application and other heavy gauge cables requiring ultra-high current protection.

Die von Littelfuse entwickelte und patentierte MEGA-Sicherung in Diffusionspillen-Technologie mit träger Charakteristik ist für Überstrom-Schutzlösungen von bis zu 500A konzipiert. Sie eignet sich ideal für Batterie- und Generator-Schutzanwendungen oder andere Bereiche mit sehr großen Kabelquerschnitten, die extrem hohe Anforderungen an den Überstromschutz stellen.

Time-Current Characteristics / Schmelzeit-Grenzwerte

% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)	
	40-250	300-500
75	- / -	4 hrs / -
100	4 hrs / -	- / -
135	120 s / 1800 s	- / 15 s
200	1 s / 15 s	1 s / -
350	300 ms / 5 s	300 ms / 5 s
600	100 ms / 1 s	- / -

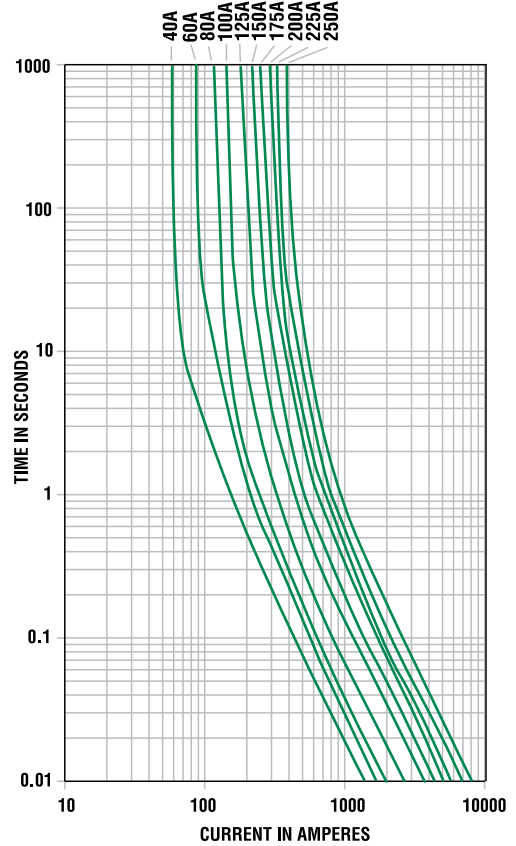
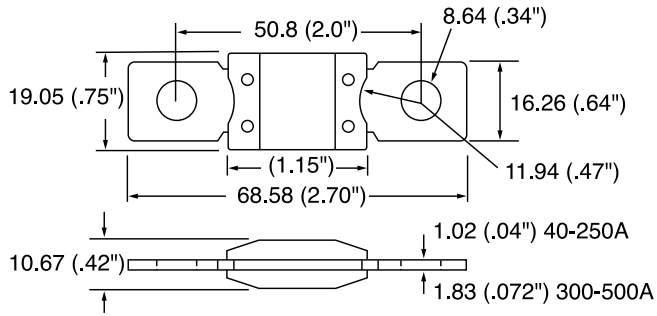
Part Number Artikel-Nr.	Current Rating Nennstrom	Color Kennfarbe	Typ. Voltage Drop Typ. Spannungsfall	Cold Resistance Kaltwiderstand	I ² t
0298040_	40 A	-	132 mV	2.510 mΩ	-
0298060_	60 A	-	119 mV	1.504 mΩ	-
0298080_	80 A	Red	87 mV	0.720 mΩ	-
0298100_	100 A	Yellow	87 mV	0.562 mΩ	31100 A ² s
0298125_	125 A	Green	80 mV	0.423 mΩ	57800 A ² s
0298150_	150 A	Orange	92 mV	0.352 mΩ	100000 A ² s
0298175_	175 A	White	86 mV	0.294 mΩ	168000 A ² s
0298200_	200 A	Blue	83 mV	0.257 mΩ	204000 A ² s
0298225_	225 A	Brown	82 mV	0.222 mΩ	257000 A ² s
0298250_	250 A	Pink	82 mV	0.201 mΩ	389000 A ² s
0298300_*	300 A	Grey	74 mV**	0.167 mΩ	-
0298350_*	350 A	Dark Green	68 mV**	0.138 mΩ	-
0298400_*	400 A	Purple	64 mV**	0.126 mΩ	-
0298450_*	450 A	Yellow-Green	60 mV**	0.112 mΩ	-
0298500_*	500 A	Brown	58 mV**	0.092 mΩ	-

* Parts with asterik are short circuit protectors only. Corresponding holder see Section "Fuse Holders."

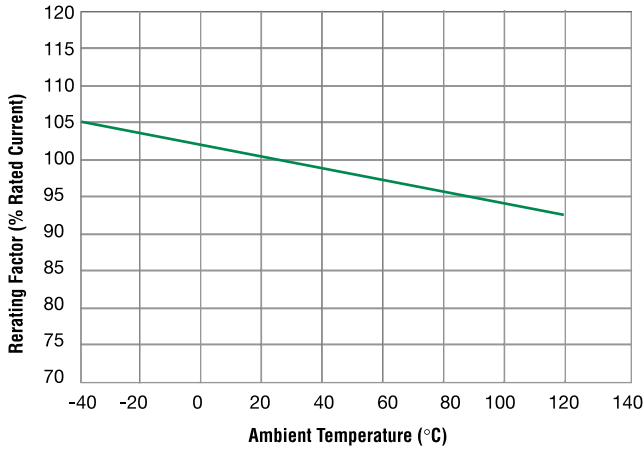
** Voltage Drop measurements for short circuit protectors are at 75% of rated current. Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.

MEGA® Fuse Rated 32V

Dimensions in mm / Maße in mm



MEGA Fuse Series Temperature Rerating Curve



Fuse Strips for Diesel Vehicles Rated 36V

RoHS



Specifications

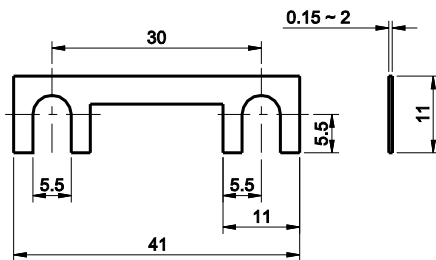
DIN 72581/2

Metal parts: Zinc-alloy

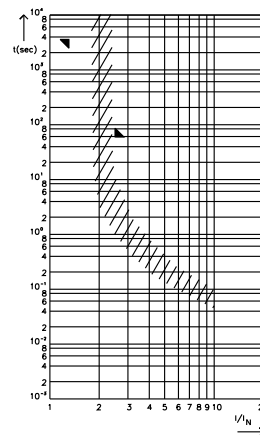
Non-housed fuse strips for Diesel vehicles.
Current rating 25A - 150A, 36 VDC. 90° fork type lugs.

Sicherungsstreifen ohne Gehäuse für Dieselfahrzeuge.
Nennstrom 25A bis 150A, 36 VDC. 90°-Anschluss in Gabelform.

Dimensions in mm / Maße in mm



Pre-arcing Time - limits / Schmelzeit-Grenzwerte DIN



FI = 1.00 (max. operating current: $1.0 \times I_{rat}$ at 23°C)

Time-Current Characteristics / Schmelzeit-Grenzwerte

% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
130	1 h / -
250	- / 60 s

Part Number Artikel-Nr.	Current Rating Nennstrom	Typ. Voltage Drop Typ. Spannungsfall	Cold Resistance Kaltwiderstand	I ² t
156.5610.525_	25 A*	70 mV	on request	on request
156.5610.530_	30 A	70 mV	on request	on request
156.5610.540_	40 A*	70 mV	on request	on request
156.5610.550_	50 A	70 mV	on request	on request
156.5610.560_	60 A*	70 mV	on request	on request
156.5610.570_	70 A*	70 mV	on request	on request
156.5610.580_	80 A	70 mV	on request	on request
156.5610.610_	100 A	70 mV	on request	on request
156.5610.611_	120 A*	70 mV	on request	on request
156.5610.612_	125 A*	70 mV	on request	on request
156.5610.615_	150 A*	70 mV	on request	on request

*Not mentioned in the standards

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.

Corresponding holder see Section "Fuse Holders."

Fuse Strips with Housing Rated 80V

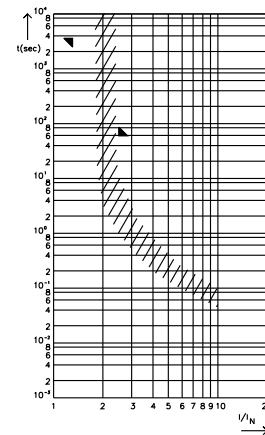
RoHS



Specifications

DIN 72581/2
Insulating body: Out of ceramic
Metal parts: Zinc-alloy
Packaging unit: 50 pieces

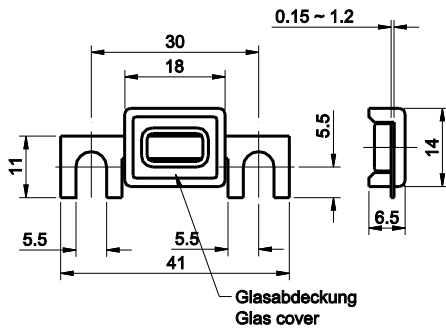
Pre-arcing Time - limits / Schmelzeit-Grenzwerte DIN



Housed fuse strips with window for visual inspection of melting element. Current rating 30A - 150A, 80 VDC. 90° fork type lugs.

Sicherungsstreifen mit Gehäuse, Fenster für visuelle Überprüfung des Schmelzelements. Nennstrom 30A bis 150A, 80 VDC. 90°-Anschluss in Gabelform.

Dimensions in mm / Maße in mm



FI = 1.00 (max. operating current : $1.0 \times I_{rat}$ at 23°C)

Time-Current Characteristics / Schmelzeit-Grenzwerte

% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
130	1 h / -
250	- / 60 s

Part Number Artikel-Nr.	Current Rating Nennstrom	Typ. Voltage Drop Typ. Spannungsfall	Cold Resistance Kaltwiderstand	I ² t
156.5611.5301	30 A*	70 mV	on request	on request
156.5611.5401	40 A*	70 mV	on request	on request
156.5611.5501	50 A*	70 mV	on request	on request
156.5611.5601	60 A*	70 mV	on request	on request
156.5611.5701	70 A*	70 mV	on request	on request
156.5611.5801	80 A*	70 mV	on request	on request
156.5611.6101	100 A*	70 mV	on request	on request
156.5611.6111	120 A*	70 mV	on request	on request
156.5611.6121	125 A*	70 mV	on request	on request
156.5611.6151	150 A*	70 mV	on request	on request

Corresponding holder see Section "Fuse Holders."
 *Not mentioned in the standards.

Fuse Strips for Battery-powered Vehicles Rated 80V

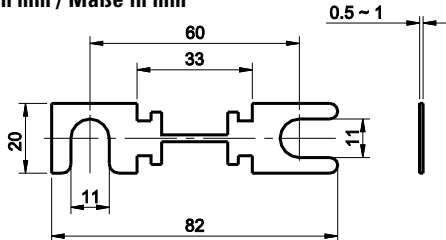
RoHS



Non-housed fuse strips for battery powered vehicles. Current rating 35 A - 500 A, 80 VDC. 90°. Straight fork type lugs.

Sicherungsstreifen ohne Gehäuse für batteriebetriebene Fahrzeuge. Nennstrom 35 A bis 500 A, 80 VDC. Mit Anschlüssen in Gabelform (90° und gerade).

Dimensions in mm / Maße in mm

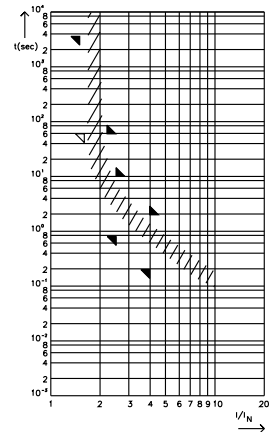


Specifications

DIN 43560/1
Metal parts: 35 A - 80 A: Zinc-alloy
 100A - 425 A: Copper Cu, gal. Sn
Packaging unit: 50 pieces

Pre-arcing Time - limits / Schmelzeit-Grenzwerte DIN

Fl = 1.00 (max. operating current: 1.0 x I_{rat} at 23°C)



Time-Current Characteristics / Schmelzeit-Grenzwerte

% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
150	1 h / - - / 60 s
220	- / 60 s - / 60 s
250	- / 60 s 800 ms / 10 s
400	- / 10 s 250 ms / 2 s 250 ms / 2 s

Part Number Artikel-Nr.		Current Rating Nennstrom	Typ. Voltage Drop Typ. Spannungsfall	Cold Resistance Kaltwiderstand	I²t
a = 11 mm	a = 9 mm*				
157.5700.5351	157.5916.5351*	35 A	125 mV	on request	on request
157.5700.5401*	-	40 A	125 mV	on request	on request
157.5700.5501	157.5916.5501*	50 A	125 mV	on request	on request
157.5700.5631	157.5916.5631*	63 A	125 mV	on request	on request
157.5700.5801	157.5916.5801*	80 A	125 mV	on request	on request
157.5700.6101	157.5916.6101*	100 A	125 mV	on request	on request
157.5700.6121	157.5916.6121*	125 A	125 mV	on request	on request
157.5700.6131*	157.5916.6131*	130 A	125 mV	on request	on request
157.5700.6141*	157.5916.6141*	135 A	125 mV	on request	on request
157.5700.6151*	157.5916.6151*	150 A	125 mV	on request	on request
157.5700.6161	157.5916.6161*	160 A	125 mV	on request	on request
157.5700.6171*	157.5916.6171*	175 A	125 mV	on request	on request
157.5700.6201	157.5916.6201*	200 A	125 mV	on request	on request
157.5700.6231*	-	225 A	125 mV	on request	on request
157.5700.6251	157.5916.6251*	250 A	125 mV	on request	on request
157.5700.6271*	-	275 A	125 mV	on request	on request
157.5700.6301	-	300 A	125 mV	on request	on request
157.5700.6331*	-	325 A	125 mV	on request	on request
157.5700.6351	-	355 A	125 mV	on request	on request
157.5700.6401*	-	400 A	125 mV	on request	on request
157.5700.6421	-	425 A	125 mV	on request	on request
157.5700.6501*	-	500 A	125 mV	on request	on request

* Not mentioned in the standards.

Corresponding holder see Section "Fuse Holders."

Fuse Strips with Housing for Battery-powered Vehicles Rated 80V



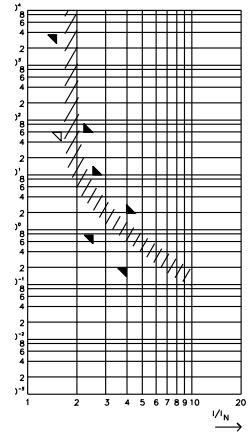
Specifications

DIN 43560/1
 UL 248 Special Purpose Fuses
 cULus Recognized: File No. E211637

Metal parts: 35A - 80A: Zinc-alloy
 100A - 425A: Copper Cu, gal. Sn

Packaging unit: 50 pieces

Pre-arcing Time - limits / Schmelzeit-Grenzwerte DIN

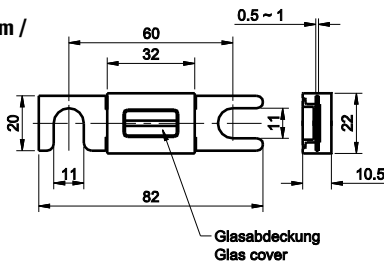


Housed fuse strips for battery-powered vehicles. Current rating 35A - 500A, 80 VDC. 90° and straight fork type lugs. With window for visual inspection of melting element.

Sicherungsstreifen mit Gehäuse für batteriebetriebene Fahrzeuge, Fenster für visuelle Überprüfung des Schmelzelements. Nennstrom 35A bis 500A, 80 VDC. Mit Anschlüssen in Gabelform (90° und gerade).

FI = 1.00 (max. operating current:
 $1.0 \times I_{rat}$ at 23°C)

Dimensions in mm /
 Maße in mm



Time-Current Characteristics / Schmelzeit-Grenzwerte

% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
150	1 h / - 60 s (1.6In) / -
220	- / 60 s - / 60 s
250	800 ms / 10 s - / 10 s
400	250 ms / 2 s 250 ms / 2 s

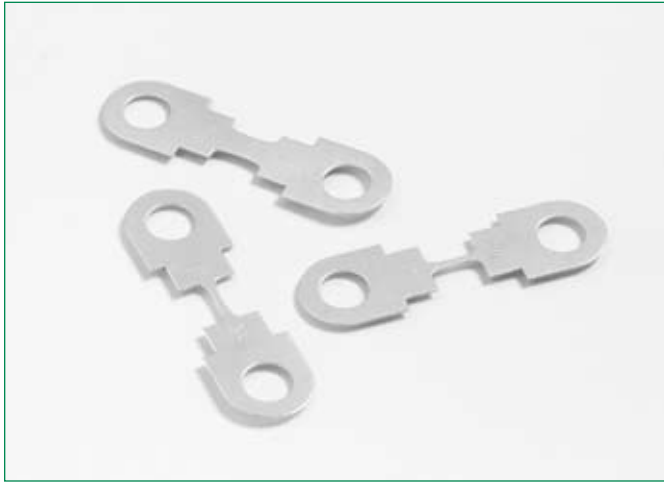
Part Number Artikel-Nr.		Current Rating Nennstrom	Typ. Voltage Drop Typ. Spannungsfall	Cold Resistance Kaltwiderstand	I²t
a = 11 mm	a = 9 mm*				
157.5701.5351	157.5917.5351*	35 A	125 mV	on request	on request
157.5701.5401*	-	40 A	125 mV	on request	on request
157.5701.5501	157.5917.5501*	50 A	125 mV	on request	on request
157.5701.5631	157.5917.5631*	63 A	125 mV	on request	on request
157.5701.5801	157.5917.5801*	80 A	125 mV	on request	on request
157.5701.6101	157.5917.6101*	100 A	125 mV	on request	on request
157.5701.6121	157.5917.6121*	125 A	125 mV	on request	on request
157.5701.6131*	-	130 A	125 mV	on request	on request
157.5701.6141*	157.5917.6141*	135 A	125 mV	on request	on request
157.5701.6151*	157.5917.6151*	150 A	125 mV	on request	on request
157.5701.6161	157.5917.6161*	160 A	125 mV	on request	on request
157.5701.6171*	157.5917.6171*	175 A	125 mV	on request	on request
157.5701.6201	157.5917.6201*	200 A	125 mV	on request	on request
157.5701.6231*	157.5917.6231*	225 A	125 mV	on request	on request
157.5701.6251	157.5917.6251*	250 A	125 mV	on request	on request
157.5701.6271*	157.5917.6271*	275 A	125 mV	on request	on request
157.5701.6301	-	300 A	125 mV	on request	on request
157.5701.6331*	157.5917.6331*	325 A	125 mV	on request	on request
157.5701.6351	157.5917.6351*	355 A	125 mV	on request	on request
157.5701.6401*	-	400 A	125 mV	on request	on request
157.5701.6421	157.5917.6421*	425 A	125 mV	on request	on request
157.5701.6501*	157.5917.6501*	500 A	125 mV	on request	on request

*Not mentioned in the standards.

Corresponding holder see Section "Fuse Holders."

HSB Fuse Rated 32V

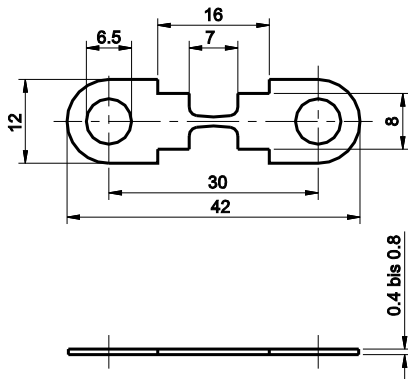
RoHS



Non-housed fuse strips for rated voltage up to 32 VDC. Current rating 35 A -175 A. Ring type lugs.

Sicherungsstreifen ohne Gehäuse für Nennspannungen bis 32 VDC. Nennstrom 35 A bis 175 A. Anschlüsse mit Bohrung.

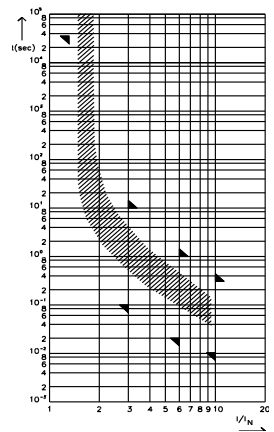
Dimensions in mm / Maße in mm



Specifications

- Material:** Zinc-alloy
- Connections:** Zinc-alloy
2 x M6 bolts, distance 30 mm
- Starting torque:** 4 Nm +/- 1 Nm

Pre-arcing Time - limits / Schmelzeit-Grenzwerte DIN



FI = 1.00 (max. operating current:
1.0 x I_{rat} at 23°C)

Time-Current Characteristics / Schmelzeit-Grenzwerte

% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
100	∞ / -
125	100 h / -
300	100 ms / 10 s
600	20 ms / 1 s
1000	10 ms / 300 ms

Part Number Artikel-Nr.	Current Rating Nennstrom	Typ. Voltage Drop Typ. Spannungsfall	Cold Resistance Kaltwiderstand	I²t
156.5677.530_	30 A	44mV	1.33 mΩ	30-3800 A²s
156.5677.540_	40 A	40mV	0.89 mΩ	40-11200 A²s
156.5677.550_	50 A	44mV	0.72 mΩ	50-21300 A²s
156.5677.560_	60 A	38mV	0.58 mΩ	60-41400 A²s
156.5677.580_	80 A	40mV	0.43 mΩ	80-44800 A²s
156.5677.611_	110 A	40mV	0.31 mΩ	110-13900 A²s
156.5677.615_	150 A	52mV	0.23 mΩ	150-465000 A²s
156.5677.617_	175 A	46mV	0.22 mΩ	175-560000 A²s

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.
Corresponding holder see Section "Fuse Holders."

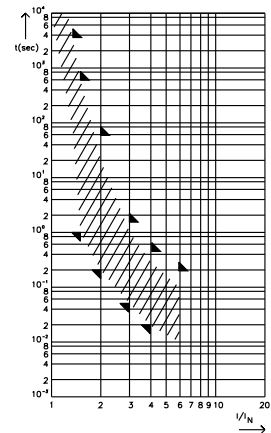
CF Fuse Rated 58V



Specifications

LWS 155.0892
 DIN 72581/6
 UL 248 Special Purpose Fuses
cULus Recognized: File No. E211637
Insulating body: Out of ceramic
Cover: Out of thermoplast (UL 94-V0, heat resistant)
 Visible melting-element
Packaging unit: 100 pieces
Breaking capacity 2,000A, 58 VDC

Pre-arcing Time - limits / Schmelzeit-Grenzwerte DIN

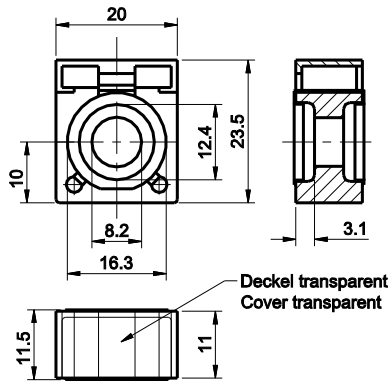


Main Fuse for mounting with battery clamp on the battery pole. Voltage rating 58 VDC, Current rating 50A - 300A. With transparent cover for visual inspection of melting element.

Hauptsicherung zur Montage an der Batterieklemme. Nennspannung 58 VDC, Nennstrom 50A bis 300A. Transparente Abdeckung für visuelle Überprüfung des Schmelzelements.

$I_f = 1.25$ (max. operating current:
 $0.8 \times I_{rat}$ at 23°C)

Dimensions in mm / Maße in mm



Time-Current Characteristics / Schmelzeit-Grenzwerte

% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
100	100 h / -
135	- / 3,600 s
150	1 s / 600 s
200	200 ms / 60 s
300	50 ms / 1,5 s
400	20 ms / 500 ms
600	- / 200 ms

Part Number Artikel-Nr.	Current Rating Nennstrom	Typ. Voltage Drop Typ. Spannungsfall	Cold Resistance Kaltwiderstand	I^2t
155.0892.5501	50 A	100 mV	1.20 mΩ	1,900 A ² s
155.0892.5751	75 A	90 mV	0.60 mΩ	12,000 A ² s
155.0892.6101	100 A	80 mV	0.60 mΩ	14,000 A ² s
155.0892.6121	125 A	75 mV	0.45 mΩ	51,000 A ² s
155.0892.6151	150 A	70 mV	0.35 mΩ	63,800 A ² s
155.0892.6171	175 A	70 mV	0.25 mΩ	120,000 A ² s
155.0892.6201	200 A	65 mV	0.25 mΩ	172,800 A ² s
155.0892.6251	250 A	70 mV	0.20 mΩ	330,000 A ² s
155.0892.6301	300 A	70 mV	0.15 mΩ	372,000 A ² s

Insert CF8-Fuse links only in conjunction with the insulating nuts, see Section "Fuse Holders."
 Corresponding battery clamp see Section "Fuse Holders."

Cable Fuses



CABLEPRO® Cable Protector Fuses Rated 32V **80**

BF-Inline Fuse Rated 32V **81**

CABLEPRO® Cable Protector Fuses Rated 32V

RoHS



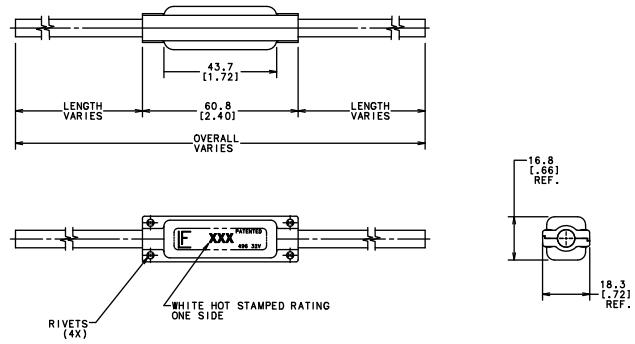
Specifications

- Voltage Rating:** 32 VDC
- Cable Type:** SAE J1127(4 & 6 AWG) & SAE J1128(8 and 6 AWG)
- Interrupting Ratings:** 2000A @ 32 VDC
- Operating Temperature Range:** -40°C to + 125°C

Cable Fuses

The CABLEPRO fuse is designed to replace conventional wire fusible links in high current automotive applications. The slim package of the CABLEPRO and the predictable and reliable performance characteristics (similar to MEGA® fuse) make this far superior over wire fusible links. Interrupting rating 2000A @ 32 VDC.

Die CABLEPRO-Sicherung wurde als Ersatz für herkömmliche Kabelsicherungen in Hochstrom-Fahrzeug-Anwendungen entwickelt. Durch ihr schlankes Gehäuse und die genau definierten, zuverlässigen Leistungsmerkmale (ähnlich wie MEGA®-Sicherung) ist CABLEPRO bisherigen Kabelsicherungen weit überlegen. Schaltvermögen bis 2000A bei 32 VDC.



Time-Current Characteristics / Schmelzeit-Grenzwerte

% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
100	100 hrs. / -
135	120 s / 1800 s
200	10 s / 300 s
350	1 s / 15 s
600	300 ms / 5 s

Part Number Artikel-Nr.	Current Rating Nennstrom	Wire Size Drahtdurchmesser	Cold Resistance Kaltwiderstand	I ² t
0496060_	60 A	5mm ² (10AWG)	0.920 mΩ	-
0496080_	80 A	8mm ² (8AWG)	0.689 mΩ	-
0496100_	100 A	8mm ² (8AWG)	0.460 mΩ	-
0496125_	125 A	13mm ² (6AWG)	0.390 mΩ	-
0496150_	150 A	19mm ² (4AWG)	0.346 mΩ	-
0496175_	175 A	19mm ² (4AWG)	0.268 mΩ	-
0496200_	200 A	19mm ² (4AWG)	0.173 mΩ	-

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.
Corresponding holder see Section "Fuse Holders."

BF-Inline Fuse Rated 32V

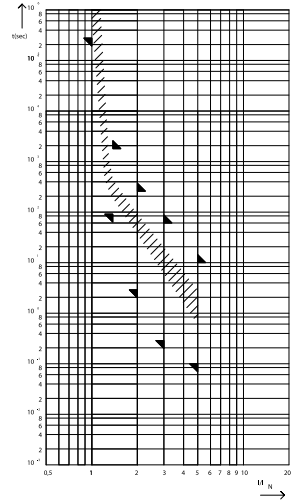
RoHS



Specifications

Voltage Rating: 32 VDC
Housing: Out of thermoplastic heat-resistant
Connections: Crimp, Copper alloy, tinned
Breaking capacity: 2.000A, 32V, DC

Pre-arcing time - limits / Schmelzeit-Grenzwerte



$F1 = 1,25$ (max. operating current:
 $0,8 \times I_{rat}$ at 23°C)

Inline fuse to protect specific cable cross-sections and insulations; Cross-section 10mm² to 35mm². For rated voltage up to 32 VDC.

In-Line- (Kabel-) Sicherung für bestimmte Kabelquerschnitte und Isolationsstärken. Querschnitt von 10 bis 35 mm², Nennspannung bis 32 VDC.

Time-Current Characteristics / Schmelzeit-Grenzwerte

% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
110	100 h /
150	90 s / 1.800 s
200	3 s / 240 s
300	300 ms / 60 s
500	100 ms / 10 s

Part Number Artikel-Nr.	Current Rating Nennstrom	Typ. Voltage Drop Typ. Spannungsfall	Cold Resistance Kaltwiderstand	I ² t
153.1002	100 A	60 mV	0,42 mΩ	26.000 A ² s
153.1012	125 A	70 mV	0,32 mΩ	86.000 A ² s
153.1612	170 A	60 mV	0,22 mΩ	250.000 A ² s
153.2512	190 A	52 mV	0,18 mΩ	610.000 A ² s
153.1602	125 A	75 mV	0,41 mΩ	28,000 A ² s
153.2502	170 A	70 mV	0,29 mΩ	75,000 A ² s
153.3502	—	in development	in development	in development

Assembly notes: The wire integrated fuse has to be insulated by using a self-adhesive shrinking tube. The wire has to be fixed on both sides of the fuse to minimize the wire forces. Recommended shrinking tube: DERAY(R)-IAKT 4:1, 24mm

Torpedo Type Fuses



Thermoplastic Fuses Rated 36V

83

Ceramic Fuses Rated 36V

84

Thermoplastic Fuse Rated 36V

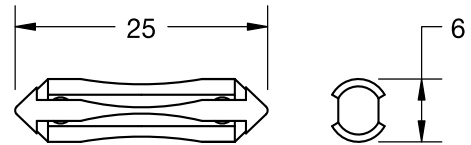
RoHS



Specifications

DIN 72581/1

Dimensions in mm / Maße in mm



Consisting of a heat resistant body, the fuse element stretches over the exterior of the body from end to end. The body varies in color indicating the current ratings.

Sie besteht aus einem hitzebeständigen Körper und einem Sicherungselement, das sich über die gesamte Außenseite des Gehäuses erstreckt. Für jeden Nennstrom wird eine andere Gehäusefarbe verwendet.

Torpedo Type Fuses

Part Number Artikel-Nr.	Current Rating Nennstrom	Housing Color Kennfarbe	Typ. Voltage Drop Typ. Spannungsfall Littelfuse max
0214005_	5A		50mV
0214008_	8A		50mV
0214016_	16A		50mV
0214025_	25A		50mV
0214040_	40A		50mV

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.
Corresponding holder see Section "Fuse Holders."

ATS Ceramic Fuse Rated 36V

RoHS

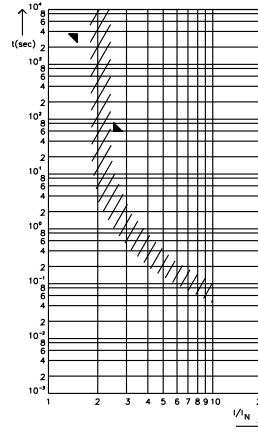


Specifications

DIN 72581-1

Insulating body: 5A: Out of thermoplastic
8A - 25A: Out of ceramic

Pre-arcing time - limits / Schmelzeit-Grenzwerte

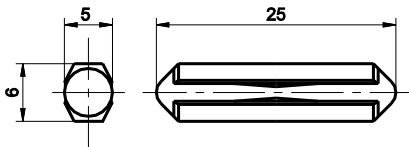


FI = 1.00 (max. operating current: 1.0 x I_{rat} at 23°C)

36 VDC Torpedo-style fuse links with current rating 5A to 40A.

Sicherungen in Torpedo-Form. Nennspannung 36 VDC, Nennstrom 5A bis 40A.

Dimensions in mm / Maße in mm



Time-Current Characteristics / Schmelzeit-Grenzwerte

% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
150	1 h / -
250	- / 60 s

Part Number Artikel-Nr.	Current Rating Nennstrom	Housing Color Kennfarbe	Typ. Voltage Drop Typ. Spannungsfall	
			Standard DIN max.	Littelfuse max.
151.5155.450_	5 A		100 mV	50mV
151.5162.480_	8 A		100 mV	50mV
151.5182.516_	16 A		100 mV	50mV
151.5182.525_	25 A		100 mV	50mV

The last figure of part number “_” = packaging code. “2” = 5000 pieces bulk pack and “3” = 100 pieces blister pack. This is referenced also on page 158. For corresponding holder see Section “Fuse Holders” in the Littelfuse Automotive Circuit Protection Products catalog.

Special Purpose Fuses

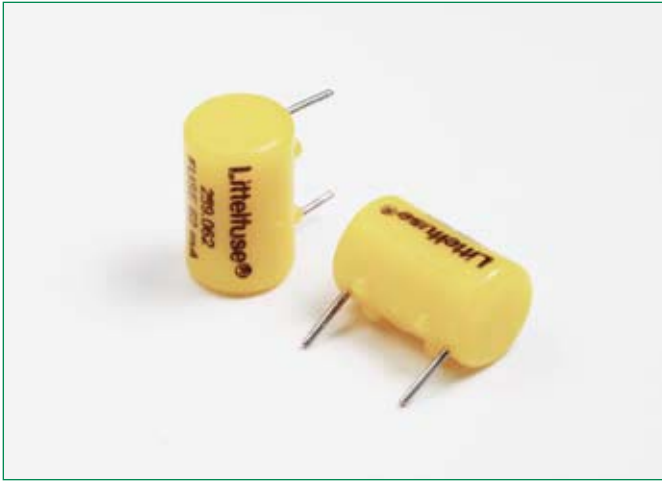


Safe-T-Plus Fuse 259 Series Rated 125V

86

Safe-T-Plus Fuse 259 Series Rated 125V

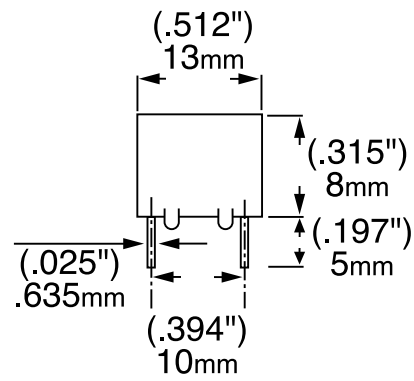
RoHS



Specifications

Voltage Rating: 125 VDC
Agency Approvals: Meets Cenelec EN500014 to 039 and IEC 60079-11.
Interrupting Ratings: 50 amperes at 125 VAC
 300 amperes at 125 VDC

Dimensions in mm / Maße in mm



- Designed to allow equipment to meet "Intrinsically Safe" certification for applications in gas plants, petrochemical and processing industries where there is a danger of gas explosion from faulty circuits.
- Hermetically sealed.
- Für Einrichtungen und Geräte entwickelt, die besonders strenge Zulassungsbedingungen ("immanente Sicherheit") erfüllen müssen, z. B. Anwendungen in Gaswerken, in der petrochemischen Industrie und anderen Bereichen, wo fehlerhafte Schaltkreise zu Gasexplosionen führen können
- Hermetisch abgedichtet.

Time-Current Characteristics / Schmelzzeit-Grenzwerte

% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
100	4 h / 5 s
200	4 h / 5 s

Part Number Artikel-Nr.	Current Rating Nennstrom	Typ. Voltage Drop Typ. Spannungsfall	Cold Resistance Kaltwiderstand	I ² t
0259.062	0.062 A	2.1	8.1	0.00016
0259.125	0.125 A	1.3	2.4	0.0012
0259.250	0.250 A	0.83	0.87	0.0095
0259.375	0.375 A	0.81	0.46	0.025
0259.500	0.500 A	0.78	0.32	0.07
0259.750	0.750 A	0.23	0.19	0.062
0259001	1 A	0.24	0.14	0.01
0259003	3.15 A	0.131	0.0295	1.27
0259005	5 A	0.110	0.0158	4.14

Schedule of limitations.

- 1) The fuse must be so mounted that creepage and clearance distances meet the requirements of Table 2 of EN50020 :1977 or Table 4 of EN50020 :1994 (equivalent to IEC 60079-11 4th Edition 1999).
- 2) When used in intrinsically safe apparatus it will be necessary to determine a surface temperature classification for the fuse.

Subminiature Fuses



TR5[®] PCB Mount Fuse

88

TR5®-Fuse links for rated voltage up to 250V



Specifications

IEC 60127-3/IV
 VDE: Licence No. 97187, No. 116448 ÜG (5A)
 Semko: Certificate No. 9812212, No. 9748179 (5A)
 cULus Recognized: No. E 67006
 METI: No. 32-1888

Base, Top: Out of thermoplastic (UL 94-V0, heat-resistant)
Round pins: Copper, tinned

Breaking capacity: 50mA - 3,15A: 35A, 250 VAC
 4A: 40A, 250 VAC
 5A - 6,3A: 50A, 250 VAC

Packaging: Last 3 digits of Article-No.
 000 = tape ammpack 1.000 pcs.
 010 = bulk 1.000 pcs.

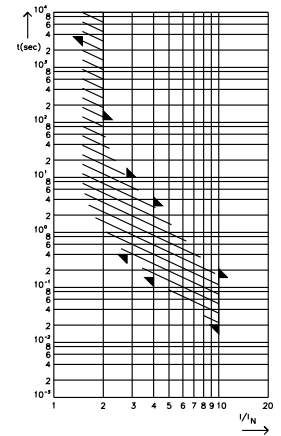
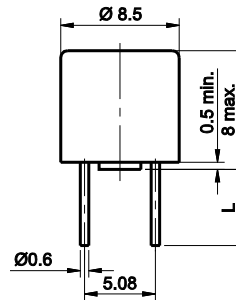
Automatic mountable fuse for through hole soldering. Rated voltage 250 VAC / 125 VDC; Current rating 40 mA - 6.3A.

Bedrahtete Sicherung für automatische Leiterplattenbestückung/ Lötprozesse. Nennspannung 250 VAC/125 VDC, Nennstrom 40 mA bis 6.3A.

Time-Current Characteristics / Schmelzeit-Grenzwerte

% of Rating % des Nennstromes	Opening Time Min / Max (s) Schmelzcharakteristik Min / Max (s)
150	60 min / -
210	- / 2 min
275	400 ms / 10 s
400	150 ms / 3 s
1000	20 ms / 150 ms

Dimensions in mm / Maße in mm



FI = 1,00 (max. operating current: 1,0 x I_{rat} at 23°C)

Part Number Artikel-Nr.	Current Rating Nennstrom	Typ. Voltage Drop Typ. Spannungsfall	I²t	Approvals						
				VDE	SEMKO	UL _C UR _{US}	METI	PSEJET*	CCC	K-Mark*
3720040_	40 mA	900 mV	0,009 A²s			•				
3720050_	50 mA	500 mV	0,01 A²s	•	•	•			•	•
3720063_	63 mA	400 mV	0,02 A²s	•	•	•			•	•
3720080_	80 mA	370 mV	0,023 A²s	•	•	•			•	•
3720100_	100 mA	300 mV	0,047 A²s	•	•	•			•	•
3720125_	125 mA	260 mV	0,066 A²s	•	•	•			•	•
3720160_	160 mA	200 mV	0,14 A²s	•	•	•			•	•
3720200_	200 mA	170 mV	0,20 A²s	•	•	•			•	•
3720250_	250 mA	150 mV	0,28 A²s	•	•	•			•	•
3720315_	315 mA	140 mV	0,36 A²s	•	•	•			•	•
3720400_	400 mA	130 mV	0,90 A²s	•	•	•			•	•
3720500_	500 mA	125 mV	1,30 A²s	•	•	•			•	•
3720630_	630 mA	120 mV	2,50 A²s	•	•	•			•	•
3720800_	800 mA	110 mV	3,80 A²s	•	•	•			•	•
3721100_	1,00 A	110 mV	5,50 A²s	•	•	•	•		•	•
3721125_	1,25 A	95 mV	9,00 A²s	•	•	•	•		•	•
3721160_	1,60 A	95 mV	14,0 A²s	•	•	•	•		•	•
3721200_	2,00 A	85 mV	23,0 A²s	•	•	•	•		•	•
3721250_	2,50 A	80 mV	35,0 A²s	•	•	•	•		•	•
3721315_	3,15 A	80 mV	60,0 A²s	•	•	•	•		•	•
3721400_	4,00 A	75 mV	95,0 A²s	•	•	•	•		•	•
3721500_	5,00 A	80 mV	94,0 A²s	G	•	•	•		•	•
3721630_**	6,30 A	58 mV	105 A²s	G	•	•	•		•	•

Last figure of part number = packaging code, see Section "Packaging Index," pg.157

*PSE-JET and K-Mark for China production

** Conducting path min. 0.2 mm

G = Expert Report

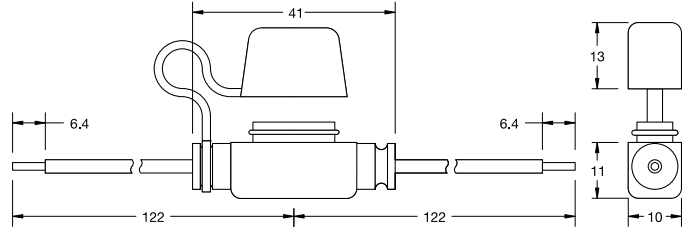
Fuse Holders



<i>In-Line Splash-Waterproof Fuseholder for MINI® Style Blade Fuse</i>	90
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Blade Fuseholders - In-Line Splash-Waterproof Fuseholder for MINI® Style Blade Fuse

RoHS



Used with MINI / FK1 Fuse 1 to 20A or 25A and 30A. Supplied with two 4.78" / 122mm wire leads. Includes protective cover for harsh environment.

Zur Benutzung mit MINI/FK1 Sicherungen von 1A bis 20A oder 25A und 30A. Lieferung mit zwei 4.78" / 122mm langen Leitungen. Die Schutzhaube erlaubt den Einsatz in rauher Umgebung

Part Number Artikel-Nr.	Description Beschreibung	Fuse Rating Sicherungs- Nennstrom
OFHM0001_	14AWG/2.1mm ² stranded black wire	20 A
OFHM0002_	12AWG/3.3mm ² stranded orange wire	30 A

Wire length, color and diameter can be customized upon request. Customization requires minimum order quantities depending on nature of modifications.

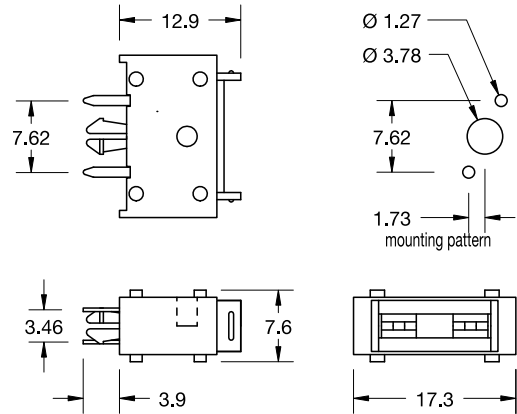
Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.

Please contact your sales representative for details.

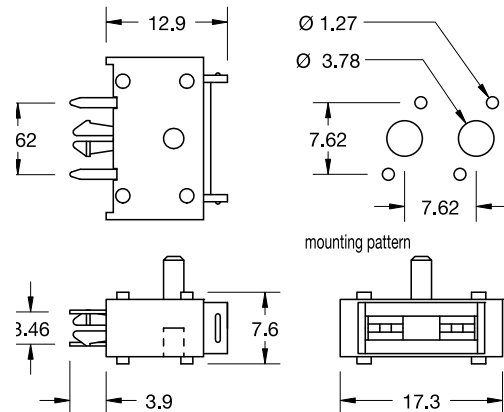
Blade Fuseholders - PCB Mount Fuseholder for MINI® Style Blade Fuse



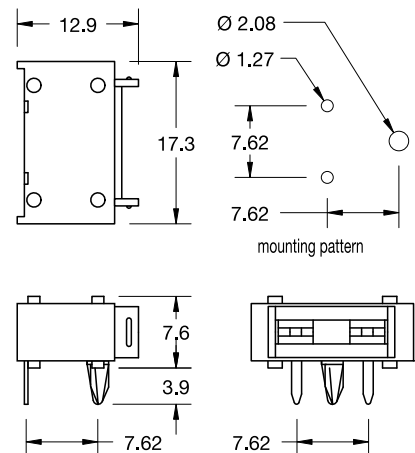
153008



153009



153007



The MINI Fuse P.C. board fuseholders bring the reliability and availability of the plug-in 32V MINI Fuse to the circuit board. Vertical and horizontal mounting of units is offered. The fuseholder has “standoffs” to accommodate board washing and incorporates a unique “board lock” anchor to maintain a firm mechanical bond to the PCB.

Mit dem MINI®-PCB-Sicherungshalter kann die 32V-MINI-Stecksicherung in vertikaler und horizontaler Montage auch auf Leiterplatten verbaut werden. Der Sicherungshalter hat Abstandshalter, die das Waschen der Leiterplatte ermöglichen, und eine einzigartige Verankerung, die beim Einsetzen oder Wechseln der Sicherung immer eine feste Verbindung zur Leiterplatte sicherstellt.

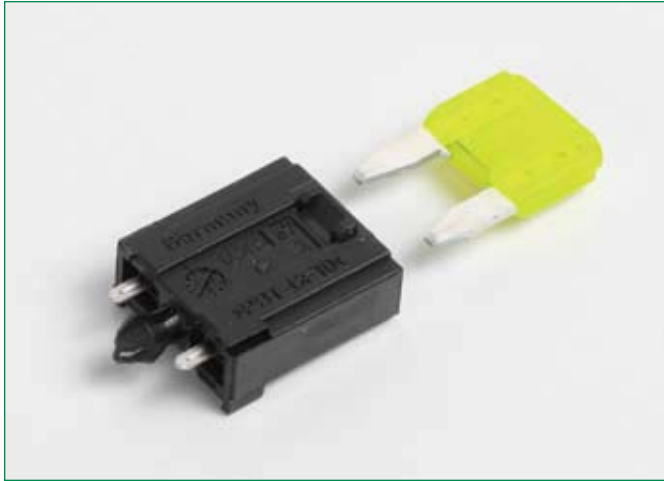
UL 15A CSA 10A (32V)

Part Number Artikel-Nr.	Description Beschreibung	Fuse Rating Sicherungs- Nennstrom
01530007_	Horizontal Mount	15 A
01530031_		20 A
01530008_	Single vertical Mount (or End Unit)	15 A
01530032_		20 A
01530009_	Stackable vertical Mount	15 A
01530033_		20 A

Last figure of part number = packaging code, see Section “Packaging Index,” pg. 157.

Blade Fuseholders - PCB Mount Fuseholder for MINI® Style Blade Fuse Rated 125V

RoHS



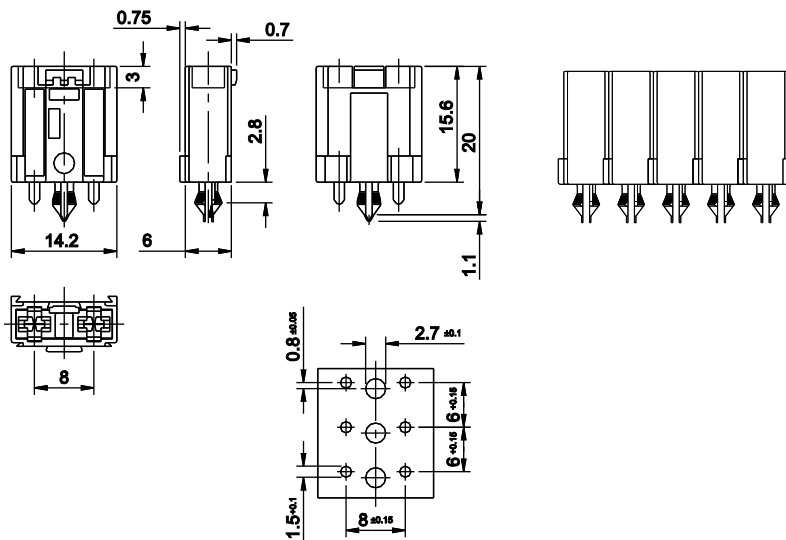
Specifications

- Housing:** Out of thermoplastic (UL 94-V0, heat-resistant)
- Connections:** Leaf spring connector systems, copper alloy, tinned
- Color:** Black
- Packaging unit:** 100 pieces

Fuse holder for MINI / FK1 fuses for PCB applications. The FL1 Fuseholder can be mounted in a row of nearly any number. The terminals fit into a 7.62 mm pitch.

Halter für MINI® / FK1-Sicherungen für Leiterplatten-Anwendungen. Die FL1-Sicherungshalter können in praktisch beliebiger Anzahl aneinandergereiht werden und passen in ein 7,62-mm-Raster.

Dimensions in mm / Maße in mm



Part Number Artikel-Nr.	Description Beschreibung	Contact Temperature Kontakttemperatur
178.6764.0001	Complete	max. 130°C

The FL1-Fuseholder can be mounted in a row in nearly any number. The below declared hole-picture was tested up to a number of 8 holders. The terminals of the holder will also fit into a 7.62 mm pitch.

Blade Fuseholder - In-Line Fuseholder for ATO® Style Blade Fuse

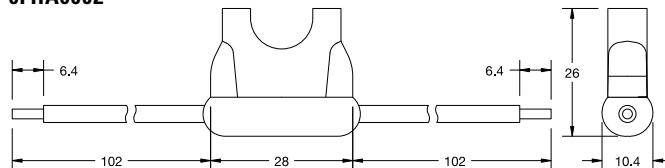
RoHS



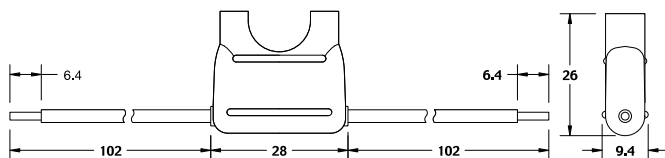
Used with ATO / FKS Fuse 1 to 20A or 25A and 30A. Supplied with two" / 102mm wire leads.

Für ATO / FKS-Sicherungen von 1A bis 20A oder 25A und 30A. Lieferung mit zwei 102mm langen Leitungen.

OFHA0002



OFHA0001



Part Number Artikel-Nr.	Description Beschreibung	Fuse Rating Sicherungs- Nennstrom
OFHA0002_	12AWG/3.3mm ² stranded orange wire	30 A
OFHA0001_	16AWG/1.3mm ² stranded black wire	20 A

Wire length, color and diameter can be customized upon request. Customization requires minimum order quantities depending on nature of modifications. Please contact your sales representative for details. Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.

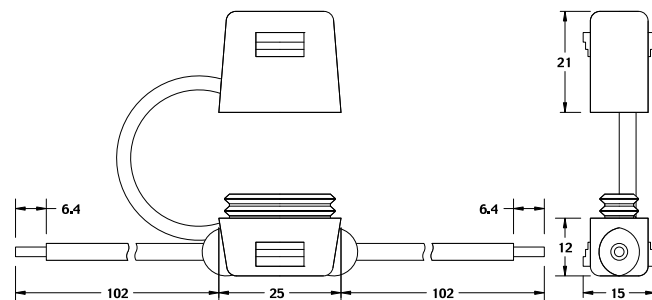
Blade Fuseholders - In-Line Splash-Waterproof Fuseholder for ATO® Style Blade Fuse

RoHS



Used with ATO / FKS Fuse 1 to 20A or 25A and 30A. Supplied with two 4" / 102mm wire leads. Includes protective cover for harsh environment.

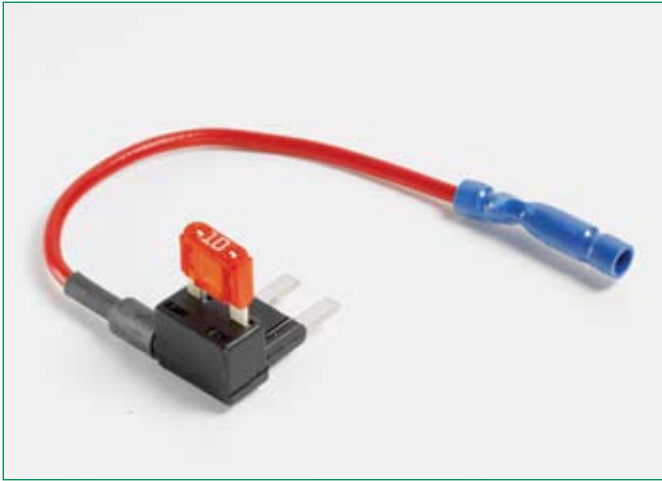
Für ATO / FKS-Style-Sicherungen von 1A bis 20A oder 25A und 30A. Lieferung mit zwei 102mm langen Leitungen (orange, AWG12). Mit Schutzhaube für raue Umgebungen.



Part Number Artikel-Nr.	Description Beschreibung	Fuse Rating Sicherungs- Nennstrom
FHAC0001_	16AWG/1.3mm ² stranded black wire	20 A
FHAC0002_	12AWG/3.3mm ² stranded orange wire	30 A

Wire length, color and diameter can be customized upon request. Customization requires minimum order quantities depending on nature of modifications. Please contact your sales representative for details. Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.

Blade Fuseholders - Add-A-Circuit MINI® Style



Extension board for an additional fuse protected tap from an existing MINI size socket. The 2 fuses for the existing and the new circuit are oriented horizontally.

Erweiterungselement mit einer zusätzlichen Sicherung für vorhandenen MINI-Sicherungssockel. Die beiden Sicherungen (vorhandener und neuer Schaltkreis) sind horizontal angeordnet.

Part Number Artikel-Nr.	Description Beschreibung	Fuse Rating Sicherungs- Nennstrom
0FHM0200Z	Fusetap and holder for installing additional accessories without splicing	10 A
0FHM0200XBP	MINI® Add-A-Circuit™ with 3, 5, 7,5 and 10 Amp MINI® fuses	10 A

Blade Fuseholders - Add-A-Circuit ATO® Style

RoHS



Extension board for an additional fuse protected tap from an existing ATO size socket. The 2 fuses for the existing and the new circuit are oriented horizontally.

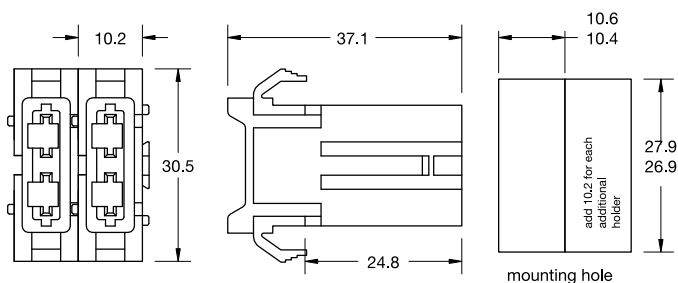
Erweiterungsplatine mit einer zusätzlichen Sicherung für vorhandenen ATO-Sicherungssockel. Die beiden Sicherungen (vorhandener und neuer Schaltkreis) sind horizontal angeordnet.

Part Number Artikel-Nr.	Description Beschreibung	Fuse Rating Sicherungs- Nennstrom
0FHA0200Z	Fusetap and holder for installing additional accessories without splicing	10 A
0FHA0200XBP	ATO® Add-A-Circuit™ with 3, 5, 7,5 and 10 Amp ATO® fuses	10 A

Blade Fuseholder - Stackable Panel Mount Fuseholder for ATO® Style Blade Fuse



Dimensions in mm / Maße in mm



Intended for use with 32V ATO / FKS Fuses rated up to 20A or 30A.

ATO / FKS-Style Flachsicherungen für Sicherungseinsätze bis 20A oder 30A Nennstrom.

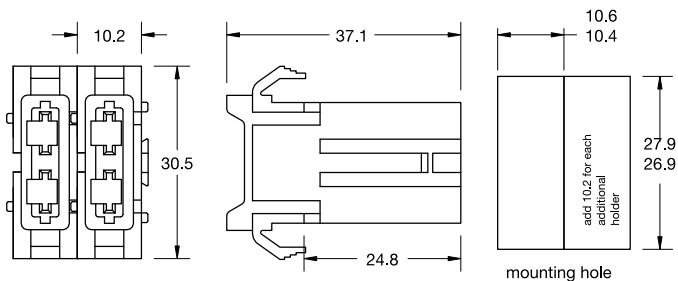
Part Number Artikel-Nr.	Description Beschreibung	Fuse Rating Sicherungs- Nennstrom
01550300_	14AWG/2.1mm ² stranded black wire	20 A
01550400_	10AWG/5.3mm ² stranded orange wire	30 A

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.

ATO® Panel Mount Holder Components

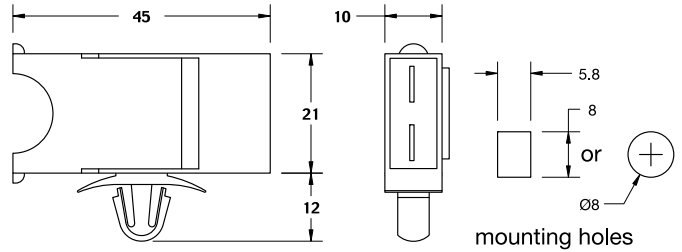


Dimensions in mm / Maße in mm



Part Number Artikel-Nr.	Description Beschreibung	Fuse Rating Sicherungs- Nennstrom
868-062-000	Housing only, color black - 2700 pcs.	-
913-043	Reeled Terminals A, wire 14AWG/2.1mm ² - 6000 pcs.	20A
0913043001	Single Terminals A, wire 14AWG/2.1mm ² - 1000 pcs.	20A
913-042	Reeled Terminals B, wire 10AWG/5.3mm ² - 5000 pcs.	30A
0913042001	Single Terminals B, wire 10AWG/5.3mm ² - 1000 pcs.	30A

Blade Fuseholders - Snap Mount Fuseholder for ATO® Style Blade Fuse



Intended for use with 32V ATO / FKS Fuses rated up to 20A.

Für den Gebrauch mit 32V ATO® / FKS Sicherungen bis 20A Nennstrom.

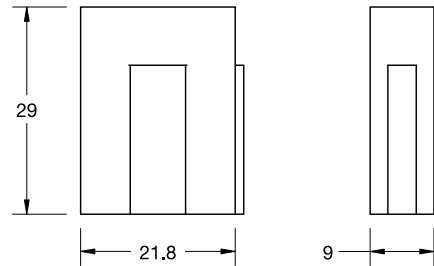
Part Number Artikel-Nr.	Description Beschreibung	Fuse Rating Sicherungs- Nennstrom
01510001_	Snap-mount holder assembled, color black	20 A

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.

Blade Fuseholders - Stackable Panel Mount Fuseholder for ATO® Style Blade Fuse



Dimensions in mm / Maße in mm



Intended for use with 32V ATO/ FKS Fuses rated up to 20A.

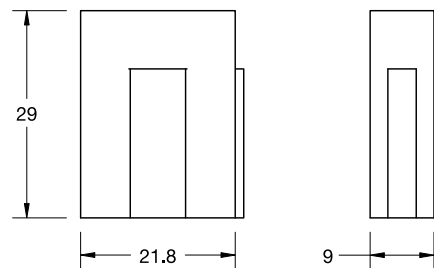
Für den Gebrauch mit 32V ATO/ FKS Sicherungen bis 20A Nennstrom.

Part Number Artikel-Nr.	Description Beschreibung	Fuse Rating Sicherungs- Nennstrom
08680900LXN	Assortment: Holders with brackets and terminals, color black - 50 pcs	20 A

Panel-Mount Stackable Components



Dimensions in mm / Maße in mm



Part Number Artikel-Nr.	Description Beschreibung	Fuse Rating Sicherungs- Nennstrom
868-900-010RM	Holder only, color black - 100 pcs.	–
868-900-020RM	Brackets only, color black - 100 pcs.	–
09130900Z	Terminals loose, wire 0.5 - 1.25 mm ² - 200 pcs.	–

Blade Fuseholders - FH2 Stackable Block Fuseholder for ATO® Style Blade Fuse Rated 80V

RoHS



Specifications

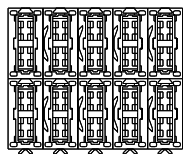
- Housing:** Out of thermoplastic (UL 94-V0, heat-resistant)
- Connections:** Leaf spring connector systems, crimp contacts, copper alloy, tinned
- Color:** Black
- Cover:** Thermoplastic (transparent)

Blockholder for ATO / FKS size fuses-links. Attachable in X- and Y-direction. Rated voltage 80V; crimp terminals.

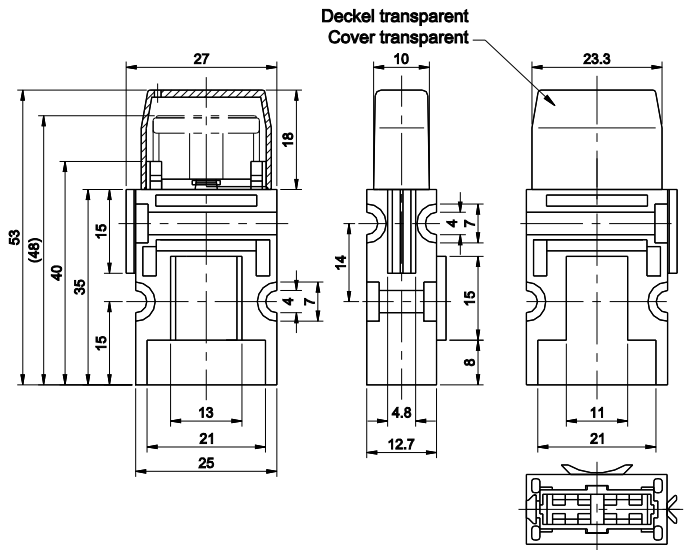
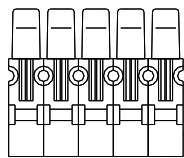
Blockhalter für Sicherungen in ATO / FKS-Größe. Montage in X- und Y-Richtung möglich. Nennspannung 80V, Crimp-Kontakte.

Dimensions in mm / Maße in mm

Chart for row-mounting



10er/pcs. Block



Part Number Artikel-Nr.	Description Beschreibung	Contact Temperature Kontakttemperatur
178.6105.000_	Complete with DFK 1.5 - 2.5 mm ²	max. 130°C
178.6115.000_	Housing	—
178.6125.000_	Cover	—
178.6116.100_*	DFK-Kontakte 0.5-1.0mm ²	max. 130°C
178.6116.250_*	Contacts 1.5-2.5mm ²	max. 130°C
178.6116.600_*	Contacts 4.0-6.0mm ²	max. 130°C

* Crimping tool available on request.

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.

Corresponding fuse links see Section "Blade Fuses."

Blade Fuseholders - FH2 Stackable Block Fuseholder for ATO® Style Blade Fuse Rated 58V

RoHS



Specifications

- Housing:** Out of thermoplastic (UL 94-V0, heat-resistant)
- Connections:** Leaf spring connector systems, crimp contacts, copper alloy, tinned
- Color:** Black
- Cover:** Thermoplastic (transparent)

Blockholder for 42V PowerNet with coding for TAC fuses-links. Attachable in X- and Y-direction. Rated voltage 58V; crimp terminals.

Blockhalter für 42-V-PowerNet, mit Kodierung für TAC-Sicherungen. Montage in X- und Y-Richtung möglich. Nennspannung 58V, Crimp-Kontakte.

Dimensions in mm / Maße in mm

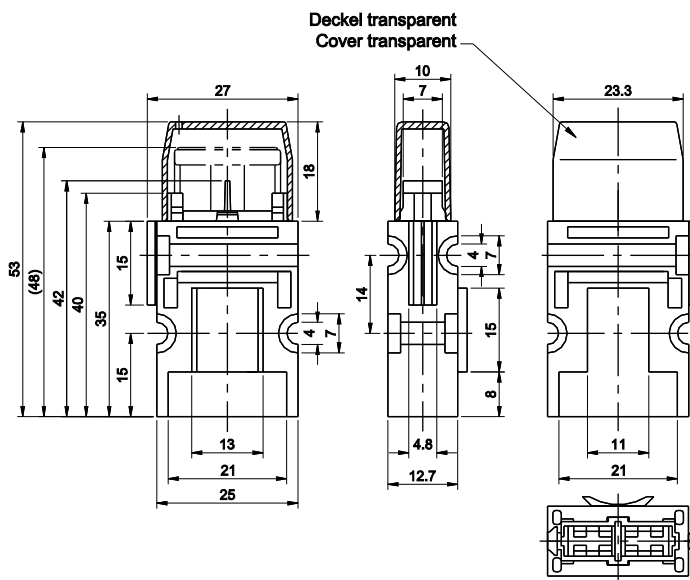
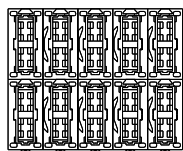
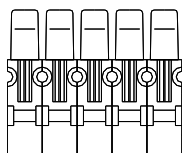


Chart for row-mounting



10er/pcs. Block



Part Number Artikel-Nr.	Description Beschreibung	Contact Temperature Kontakttemperatur
178.4205.000_	Complete with DFK 1.5 - 2.5 mm ²	max. 130°C
178.4215.000_	Housing	—
178.6125.000_	Cover	—
178.6116.100_*	DFK-Kontakte 0.5-1.0mm ²	max. 130°C
178.6116.250_*	Contacts 1.5-2.5mm ²	max. 130°C
178.6116.600_*	Contacts 4.0-6.0mm ²	max. 130°C

*Crimping tool available on request.

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.

Corresponding fuse links see Section "Blade Fuses."

Blade Fuseholders - FKH Stackable Fuseholder for ATO® Style Blade Fuse Rated 58V

RoHS



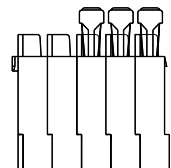
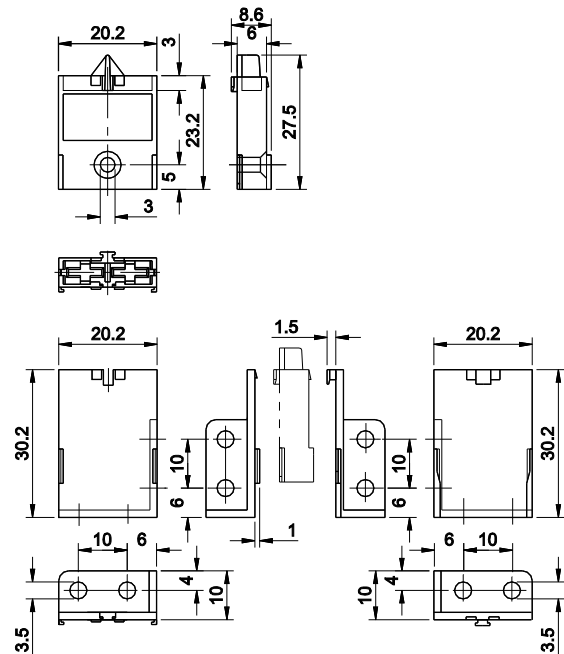
Specifications

- Housing + Adapter:** Out of thermoplastic (UL 94-V0, heat-resistant)
- Connections:** Leaf spring connector systems, soldering terminals (4 pins each), copper alloy, tinned
- Color:** Black

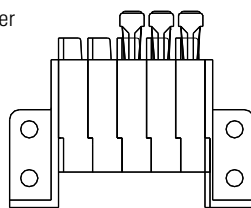
Fuseholder for 42V PowerNet with coding for TAC fuses-links. Attachable in X - direction. Rated voltage 58V; crimp terminals.

Sicherungshalter für 42V PowerNet, mit Kodierung für TAC-Sicherungen. Montage in X-Richtung. Nennspannung 58V, Crimp-Kontakte.

Dimensions in mm / Maße in mm



with Adapter



Part Number Artikel-Nr.	Description Beschreibung	Contact Temperature Kontakttemperatur
178.4252.000_	Complete	max. 130°C
178.4250.000_	Housing	–
178.6116.250_	Contacts 1.5 - 2.5 mm ²	max. 130°C
178.6191.000_	Adapter right	–
178.6192.000_	Adapter left	–

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.

Corresponding fuse links see Section "Blade Fuses."

This FKH 42V-Fuseholder can be mounted in row in any number. The fixing adapters are not included in the fuseholder. Please order the adapter separately.

Blade Fuseholders - FKH Stackable Fuseholder for ATO® Style Blade Fuse Rated 80V

RoHS



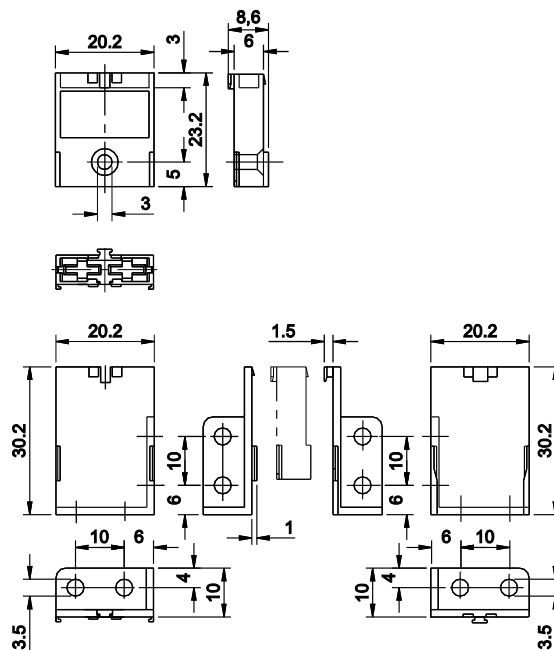
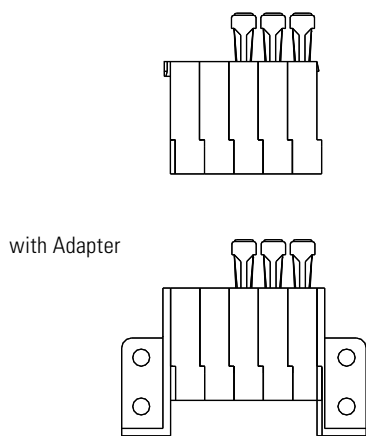
Specifications

Housing + Adapter: Out of thermoplastic (UL 94-V0, heat-resistant)
Connections: Leaf spring connector systems, soldering terminals, copper alloy, tinned
Color: Black

Dimensions in mm / Maße in mm

Fuseholder for ATO / FKS size fuses-links. Attachable in X - direction. Rated voltage 80V; crimp terminals.

Sicherungshalter für Sicherungen in ATO / FKS-Größe. Montage in X-Richtung. Nennspannung 80V, Crimp-Kontakte.



Part Number Artikel-Nr.	Description Beschreibung	Contact Temperature Kontakttemperatur
178.6152.000_	Complete	max. 130°C
178.6150.000_	Housing	-
178.6116.250_	Complete with 1.5 - 2.5 mm ²	max. 130°C
178.6152.250_	With 200 mm wiring loop	-
178.6191.000_	Adapter right	-
178.6192.000_	Adapter left	-

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.

Corresponding fuse links see Section "Blade Fuses."

This FKH-Fuseholder can be mounted in row in any number. The fixing adapters are not included in the fuseholder. Please order the adapter separately.

Blade Fuseholders - FLR PCB Fuseholder for ATO® Style Blade Fuse rated 80V

RoHS



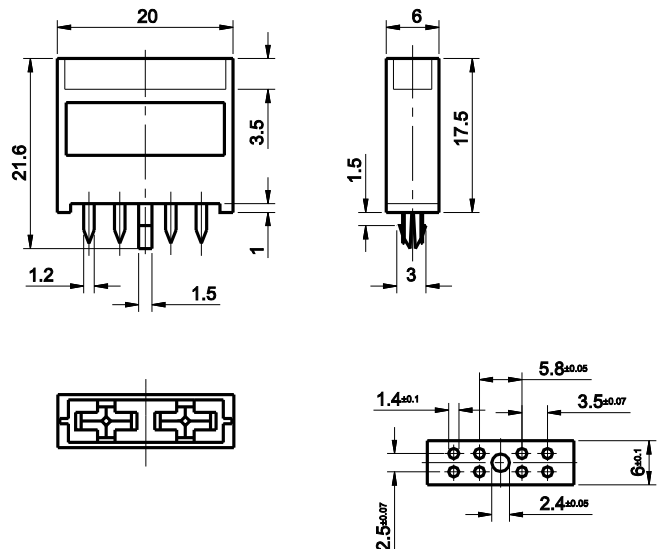
Specifications

- Housing:** Out of thermoplastic (UL 94-V0, heat-resistant)
- Connections:** Leaf spring connector systems, soldering terminals (4 pins each), copper alloy, silver plated
- Color:** Black

PCB Fuseholder for ATO/FKS size fuse-links. For through hole soldering. Rated voltage 80V.

PCB-Sicherungshalter für Sicherungen in ATO / FKS-Größe. Durchlötmontage, Nennspannung 80V.

Dimensions in mm / Maße in mm

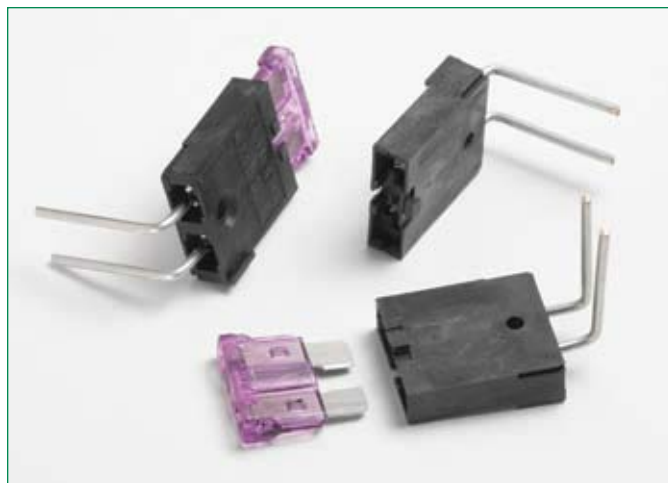


Part Number Artikel-Nr.	Description Beschreibung	Contact Temperature Kontakttemperatur
178.6165.000_	Complete	max. 130°C

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.
Corresponding fuse links see Section "Blade Fuses."

Blade Fuseholders - FKH Fuseholder with 90° connection for ATO® Style Blade Fuse rated 80V

RoHS



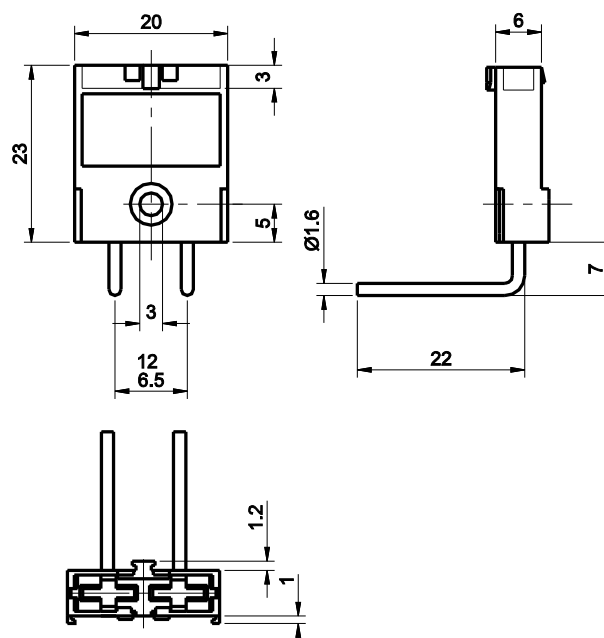
Specifications

- Housing:** Out of thermoplastic (UL 94-V0, heat-resistant)
- Connections:** Leaf spring connector systems, soldering contacts (2 pins), copper alloy, tinned
- Color:** Black
- Packaging unit:** 100 pieces

Fuseholder for ATO / FKS size fuses-links. 90° bended solderable tin plated contacts. Rated voltage 80V.

Sicherungshalter für Sicherungen in ATO / FKS-Größe. 90°-gewinkelte, verzinnnte Lötanschlüsse. Nennspannung 80V.

Dimensions in mm / Maße in mm



Fuse Holders

Part Number Artikel-Nr.	Description Beschreibung	Contact Temperature Kontakttemperatur
178.7017.0001	Complete	max. 130°C

Corresponding fuse links see Section "Blade Fuses."

Blade Fuseholders - FLR PCB Fuseholder for ATO® Style Blade Fuse rated 58V

RoHS



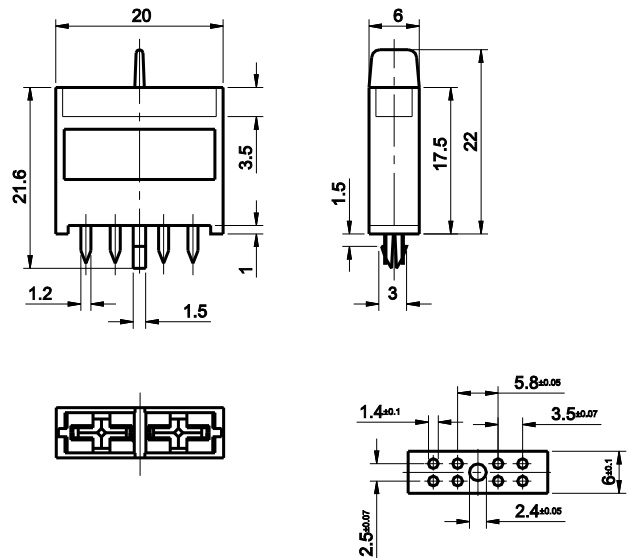
Specifications

- Housing:** Out of thermoplastic (UL 94-V0, heat-resistant)
- Connections:** Leaf spring connector systems, soldering terminals (4 pins each), copper alloy, tinned
- Color:** Black
- Packaging unit:** 500 pieces

PCB fuseholder for 42V PowerNet with coding for TAC fuses-links. For through hole soldering. Rated voltage 58V.

PCB-Sicherungshalter für 42-V-PowerNet, mit Kodierung für TAC-Sicherungen. Durchlötmontage, Nennspannung 58V.

Dimensions in mm / Maße in mm



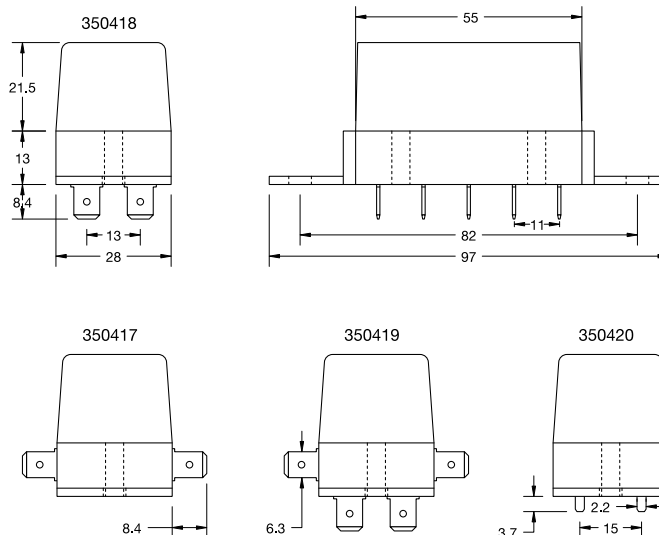
Part Number Artikel-Nr.	Description Beschreibung	Contact Temperature Kontakttemperatur
178.4265.0002	Complete	max. 130°C

Corresponding fuse links see Section "Blade Fuses."

Blade Fuseholders - 5 position Block Fuseholder for ATO® Style Blade Fuse



Dimensions in mm / Maße in mm



Use with ATO fuses up to 15A. Available in 5 pole unit with removable clear protective cover. Available in side or bottom positioned 1/4" Q.C. terminal configurations. Unit with bottom Q.C. terminals includes detachable side mounting brackets.

Für ATO-Sicherungen bis 15A. Erhältlich als 5er-Block mit abnehmbarer Klarsicht-Schutzhaube und 1/4" Flachsteckanschlüssen (wahlweise seitlich oder unten). Die Version mit Flachsteckanschlüssen auf der Unterseite verfügt über abnehmbare seitliche Halterungen.

Part Number Artikel-Nr.	Description Beschreibung	Fuse Rating Sicherungs-Nennstrom
03500418_	ATO® block 5 positions, vertical contacts	15 A
03500419_	ATO® block 5 positions, horizontal + vertical contacts	15 A
03500420_	ATO® block 5 positions, P.C. Board contacts	15 A
03500417_	ATO® block 5 positions, horizontal contacts	15 A

Corresponding fuse links see Section "Blade Fuses."

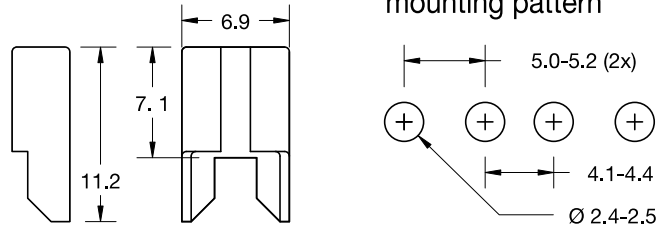
Please contact your sales representative for details.

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.

Blade Fuseholders - PCB Fuse Clip for ATO® Style Blade Fuse



Dimensions in mm / Maße in mm



PCB clip for ATO/ FKS size fuses. For through hole soldering.

Leiterplatten-Clip für ATO® / FKS-Sicherungen, Durchlötmontage.

Part Number Artikel-Nr.	Description Beschreibung	Fuse Rating Sicherungs- Nennstrom
01000057_	Tin plated for P.C. Board mounting	15 A

Corresponding fuse links see Section "Blade Fuses."

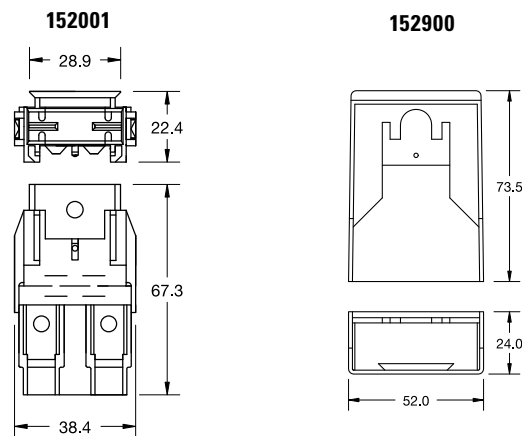
Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.

Blade Fuseholders - Fuseholder for MAXI™ Style Blade Fuse

RoHS



Dimensions in mm / Maße in mm



The In-Line Fuseholder provides an efficient, simple installation method for MAXI/ FK3-Style Fuse applications.

Der In-Line-Sicherungshalter ermöglicht eine effiziente, einfache Installation von MAXI/ FK3-Style -Sicherungen.

Part Number Artikel-Nr.	Description Beschreibung	Fuse Rating Sicherungs- Nennstrom
01520001TXN940	Assortiment: Fuseholder with screws and terminals - 10 pcs.	60 A
01520001TXN941	Assortiment: Fuseholder, Cover with screws and terminals - 10 pcs.	60 A

MAXI™ Components

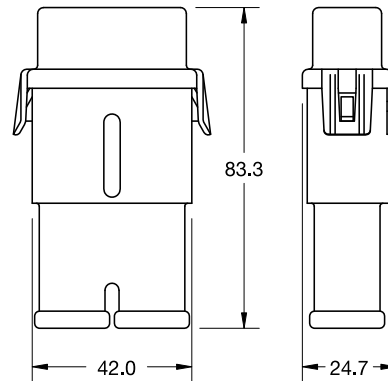
Part Number Artikel-Nr.	Description Beschreibung	Fuse Rating Sicherungs-Nennstrom
01520001_	Fuse holder	60 A
01520900_	Cover	–
09130653_	Terminals for wire Ø 2.5 - 6 mm ²	–
09130654_	Terminals for wire Ø 5 - 10 mm ²	–
09130550_	Screws Ø 5.3 mm, M 5x8	–

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.

Blade Fuseholders - Splash-waterproof Fuseholder for MAXI™ Style Blade Fuse



Dimensions in mm / Maße in mm



The In-Line Splash-water-proof fuseholder provides an efficient, simple installation method for MAXI / FK3-style fuse applications in harsh under-the-hood environments

Der spritzwassergeschützte In-Line-Sicherungshalter ermöglicht eine effiziente, einfache Installation von MAXI / FK3-Sicherungen in Anwendungen mit rauen Umgebungsbedingungen, z. B. freiliegende Karosserie-/Motorraumbereiche.

Part Number Artikel-Nr.	Description Beschreibung	Fuse Rating Sicherungs-Nennstrom
01520003TXN941	Assortment: Fuseholder 01520003 with terminals, seals and cover for 4-6mm ² - 10 pcs.	60 A
01520003TXN942	Assortment: Fuseholder 01520003 with terminals, seals and cover for 6-10mm ² - 10 pcs.	60 A
279.6850.0402	Assortment: Fuseholder 279.6800.000 with terminals, seals and cover for 4mm ² - 10 pcs.	80 A
279.6850.0602	Assortment: Fuseholder 279.6800.000 with terminals, seals and cover for 6-10mm ² - 10 pcs.	80 A
279.6850.1602	Assortment: Fuseholder 279.6800.000 with terminals, seals and cover for 16mm ² - 10 pcs.	80 A

Splash-waterproof MAXI™ Components

Part Number Artikel-Nr.	Description Beschreibung	Fuse Rating Sicherungs-Nennstrom
279.6800.000_	Fuseholder UL 94-V0 *	80 A
01520003_	Fuseholder PA66-GF30*	–
01520903_	Cover	–
0913726001	Loose terminals for wire Ø 2.5 - 4 mm ² - 300 pcs	–
09130726TXN	Loose terminals for wire Ø 2.5 - 4 mm ² - 10 pcs	–
0913727001	Loose terminals for wire Ø 4 - 6 mm ² - 300 pcs	–
09130727TXN	Loose terminals for wire Ø 4 - 6 mm ² - 10 pcs	–
0913728001	Loose terminals for wire Ø 6 - 10 mm ² - 300 pcs	–
09130728TXN	Loose terminals for wire Ø 6 - 10 mm ² - 10 pcs	–
868-905	Wire seals for wire Ø 2.5 - 6 mm ² , bulk - 1000 pcs	–
08680905TXN	Wire seals for wire Ø 2.5 - 6 mm ² - 10 pcs	–
868-906	Wire seals for wire Ø 6 - 10 mm ² , bulk - 1000 pcs	–
08680906TXN	Wire seals for wire Ø 6 - 10 mm ² - 10 pcs	–

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.

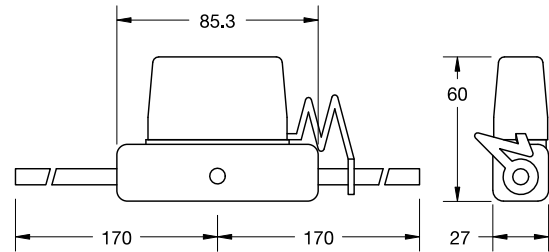
* PA66-GF30: heat resistant, hitzefest

UL 94-V0: self extinguishing, selbstlöschend

Blade Fuseholders - In-Line Fuseholder for MAXI™ Style Blade Fuse



Dimensions in mm / Maße in mm



Supplied with two 6" leads - 6 gauge wire for up to 60A MAXI/FK3 Fuse applications, this In-Line Fuseholder also provides a protective cover for harsh under-the-hood environments. Mounting hole also permits easy bulkhead installation.

In-Line-Sicherungshalter für MAXI/ FK3-Sicherungen bis 60A. Lieferung mit zwei 152.4mm langen Leitungen (AWG6). Mit Schutzhaube für raue Umgebungen und Bohrung zur einfachen Montage an Stehblechen/Karosserietraversen.

Part Number Artikel-Nr.	Description Beschreibung	Fuse Rating Sicherungs- Nennstrom
0MAH0001Z	Wire color black	60 A

Bolt-down Fuseholders - Fuseholder for BF1 Style Bolt-down Fuse

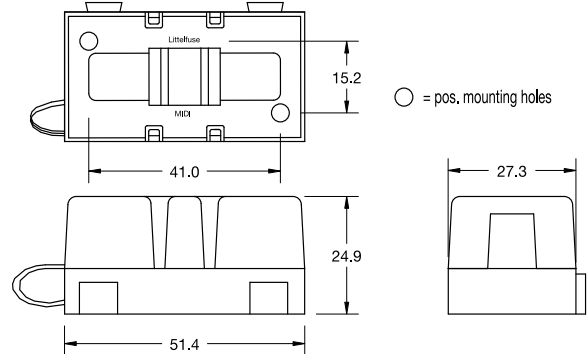
RoHS



Use with BF1 /MIDI fuses up to 200A. Includes protective cover. Features interconnecting pins on side of fuse block for secure multiple block configurations. Includes M5 threaded studs and hex nuts with lock washers. Fuse not included.

Für BF1 / MIDI-Sicherungen bis 200A. Mit Schutzhaube und seitlichen Verbindungs-Pins für zuverlässige Multi-Block-Konfigurationen. Lieferung mit M5-Gewindebolzen, Sechskantmuttern und Federringen. Sicherung nicht im Lieferumfang enthalten.

Dimensions in mm / Maße in mm



Part Number Artikel-Nr.	Description Beschreibung	Fuse Rating Sicherungs- Nennstrom
04980900ZXT	330 pcs.	200 A
0498900.TXN	10 pcs.	200 A
04980903ZXT	Holder with mounting brackets - 264 pcs.	200 A

Corresponding fuses see Section "Bolt-down Fuses."

Bolt-down Fuseholders-Fuseholder for MEGA® Style Bolt-down Fuse

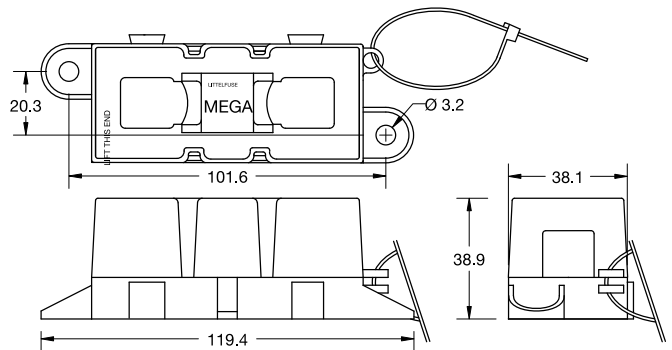
RoHS



Use with MEGA fuses up to 500A. Ideal for battery and alternator connections and other heavy gauge cables requiring ultra high current protection. Includes protective cover. Features interconnecting pins on side of fuse block for secure multiple block configurations. Includes M8 threaded studs and hex nuts with lock washers. Fuse not included.

Für MEGA-Sicherungen bis 500A. Ideal für Batterie- und Generator-Schutzanwendungen oder andere Bereiche mit sehr großen Kabelquerschnitten, die extrem hohe Anforderungen an den Überstromschutz stellen. Mit Schutzhaube und seitlichen Verbindungs-Pins für zuverlässige Multi-Block-Konfigurationen. Lieferung mit M8-Gewindebolzen, Sechskantmuttern und Federringen. Sicherung nicht im Lieferumfang enthalten.

Dimensions in mm / Maße in mm



Part Number Artikel-Nr.	Description Beschreibung	Fuse Rating Sicherungs- Nennstrom
02981001ZXT	160 pcs.	500 A
02980900TXN	10 pcs.	500 A

Corresponding fuses see Section "Bolt-down Fuses."

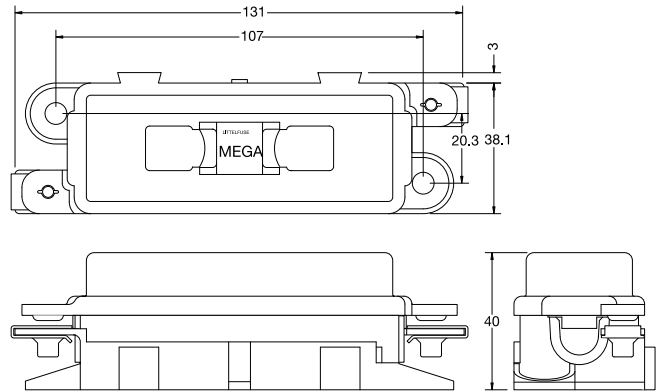
Bolt-down Fuseholders - Splash-Waterproof Fuseholder for MEGA® Style Bolt-down Fuse



For use with MEGA fuses the holder offers splash-water-proof protection for use in harsh environments.

Spritzwassergeschützter MEGA-Sicherungshalter für raue Umgebungsbedingungen.

Dimensions in mm / Maße in mm



Part Number Artikel-Nr.	Description Beschreibung	Fuse Rating Sicherungs- Nennstrom
298907-030	Holder	250 A
298907-040	Cover	–

Corresponding fuses see Section "Bolt-down Fuses."

Bolt-down Fuseholders - Fuse Base for Fuse Strips Rated 80V

RoHS



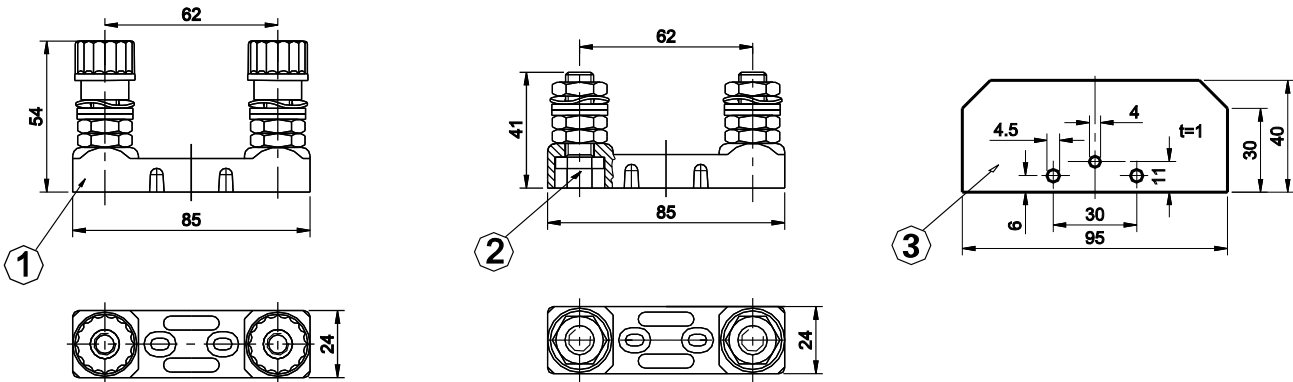
Specifications

- Base:** Insulation material according to DIN 7708/1
Spring washer according ISO 4036
Hexagon nuts according to DIN 439
Washer according to DIN 125
- Conducting materials:** Copper wrought alloy / alliage cuivreux
- Color:** Black / noir
- Packaging unit:** 10 pieces

Fuse base for fuse strips with 62mm spacing. Up to 80V.

Sicherungshalter für Sicherungstreifen mit Stichmaß 62mm, bis 80V.

Dimensions in mm / Maße in mm



Part Number Artikel-Nr.	Description Beschreibung	Contact Temperature Kontakttemperatur
177.5701.0001	1) Fuse base	max. 425 A
177.5731.0001	2) Fuse base	max. 425 A
192.5710.0001	3) Phase barrier	–

Corresponding fuse strips see Section "Bolt-down Fuses."

Bolt-down Fuseholders - Fuse Base for Fuse Strips Rated 80V

RoHS



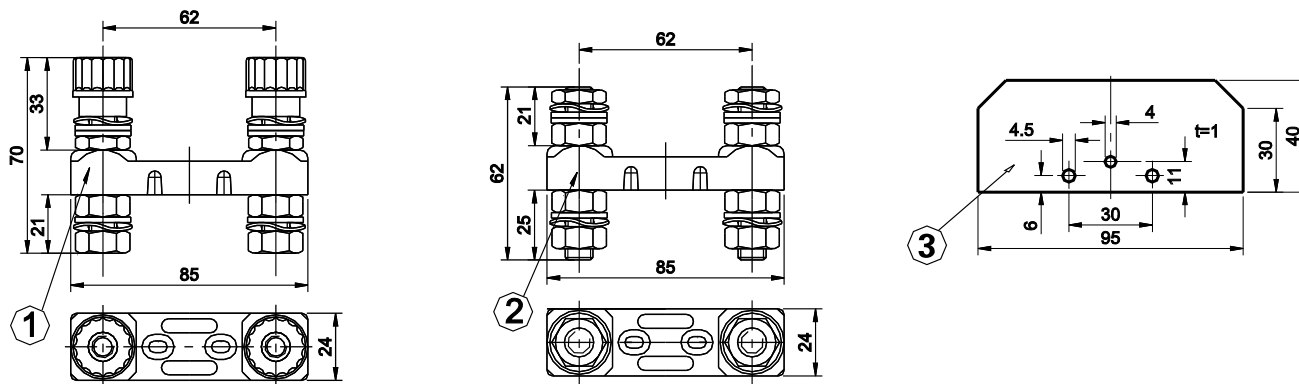
Specifications

Base:	Insulation material according to DIN 7708/1 Spring washer according ISO 4036 Hexagon nuts according to DIN 439 Washer according to DIN 125
Conducting materials:	Copper wrought alloy / alliage cuivreux
Color:	Black / noir
Packaging unit:	10 pieces

Fuse base for fuse strips with 62mm spacing. Up to 80V.

Sicherungshalter für Sicherungstreifen mit Stichmaß 62mm, bis 80V.

Dimensions in mm / Maße in mm



Part Number Artikel-Nr.	Description Beschreibung	Contact Temperature Kontakttemperatur
177.5702.0001	1) Fuse base	max. 250 A
177.5741.0001	2) Fuse base	max. 250 A
192.5710.0001	3) Phase barrier	–

Corresponding fuse strips see Section "Bolt-down Fuses."

Battery Clamp for CF8 Fuse Rated 58V

RoHS



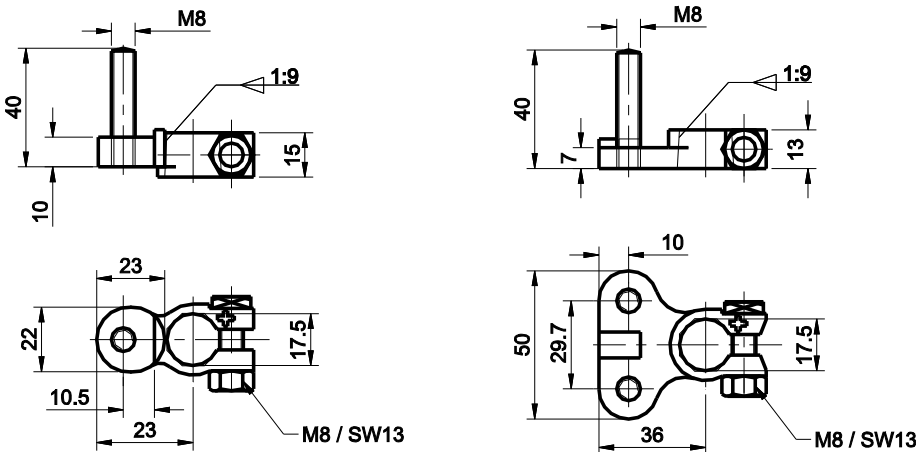
Specifications

Material:	Brass G-Cu Zn 33 Pb
Starting torque:	10 Nm at batterypole, 12 Nm Compact Fuse
Packaging unit:	Pos 1: 100 pieces
	Pos 2: 50 pieces

Battery clamp for CF8 Fuse links. Both battery clamps have an integrated twisted protection for the CF8-fuse link.

Batterieklemme für CF8-Sicherungen. Beide Batterieklemmer haben einen integrierten Verdrehenschutz für die CF8-Sicherungen.

Dimensions in mm / Maße in mm



Part Number Artikel-Nr.	Description Beschreibung	Fuse Rating Nennstrom
255.1000.000_	Battery clamp 1 pole	max. 250 A (23+5°C)
255.2000.000_	Battery clamp 2 pole	max. 250 A (23+5°C)

CF8-fuses links only in conjunction with Insulating nuts 255.0808.0001, 255.0899.4001 or 255.0899.5001.

Corresponding CF8-fuse links see Section "Bolt-down Fuses."

Insert CF8-Fuse links only in conjunction with the insulating nut see next page.

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.

Insulating Nuts for CF8 Fuse

RoHS



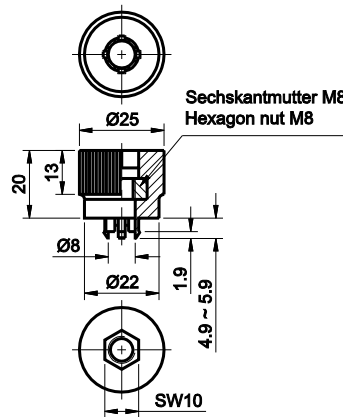
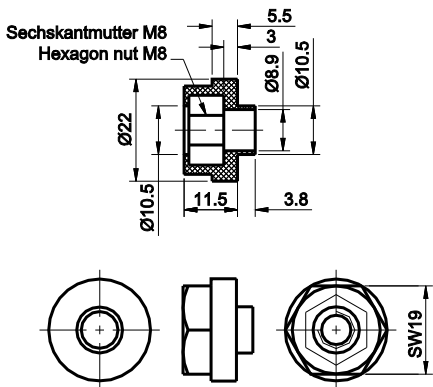
Specifications

Material: Thermoplastic, Duroplastic
Packaging unit: Pos.1 = 250 pieces
 Pos.2 + 3 = 100 pieces

Insulating nuts for CF8 Fuse links.

Isoliermuttern für CF8-Sicherungen.

Dimensions in mm / Maße in mm



Part Number Artikel-Nr.	Description Beschreibung	Contact Temperature Kontakttemperatur
255.0808.0001	Insulating nut (Duroplastic)	max. 300 A (23°C+5°C)
255.0899.4001	Insulating nut with locking hook 4.9mm (Thermoplastic) (Red)	max. 150 A (23°C+5°C)
255.0899.5001	Insulating nut with locking hook 5.9mm (Thermoplastic) (Black)	max. 150 A (23°C+5°C)

Corresponding fuse links see Section "Bolt-down Fuses."

ATS In-line Fuseholder for Torpedo Style Fuse Rated 36V

RoHS



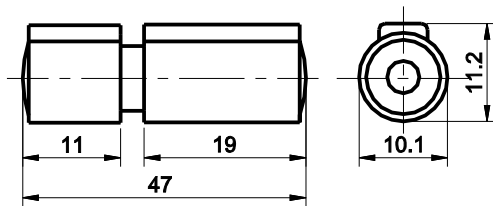
Specifications

- Housing:** Out of thermoplastic (UL 94-V0, heat-resistant)
- Connections:** Squeeze and screw connections for 2.5mm² cable
- Metal parts:** Copper alloy
- Color:** Black
- Packaging unit:** 100 pieces

ATS Inline holder for Torpedo-style fuse links up to 36V.

In-Line-Sicherungshalter für Torpedo-Sicherungen bis 36V.

Dimensions in mm / Maße in mm



Part Number Artikel-Nr.	Description Beschreibung	Contact Temperature Kontakttemperatur
276.5105.0002	Without fuse link	–
276.5105.4802	With fuse link 8A	–
276.5105.5162	With fuse link 16A	–

Corresponding fuse links see Section "Torpedo Type Fuses."

Power Distribution Centers



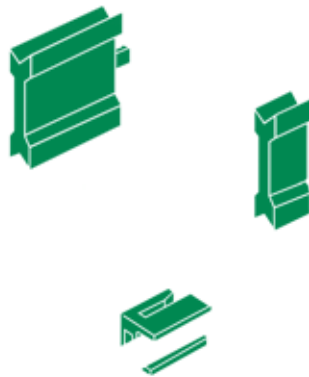
POWR-BLOK™ Modules

118

Littelfuse POWR-BLOKS™

The Littelfuse POWR-BLOKS™ system gives you unlimited flexibility to design electrical distribution systems. It's a totally modular way to build your own junction box. POWR-BLOKS are perfect for applications where space or vehicle function demand a tailor made approach. The Littelfuse POWR-BLOKS can be modified, re-sized, reconfigured or added to at any time.

Das POWR-BLOKS™-System von Littelfuse bietet Ihnen unbegrenzte Flexibilität in der Auslegung von elektrischen Verteilungssystemen. Dank seiner ganz und gar modularen Konzeption können Sie Ihre eigenen Stromverteilung bauen. POWR-BLOKS™ sind ideal für Anwendungen, in denen aus Platz, aus Gründen der Fahrzeugfunktion eine maßgeschneiderte Lösung erforderlich ist. POWR-BLOKS™ von Littelfuse können jederzeit geändert, neu dimensioniert oder konfiguriert oder ergänzt werden.



Mechanical Strength for Any Application

POWR-BLOKS modules are molded from glass reinforced nylon for dimensional stability, excellent rigidity, high and low temperature resistance and tensile strength:

Test	POWR-BLOKS™ Standard
Voltage Rating	48VDC
Temperature range	-40°C to +125°C
Durability	Minimum 50 cycles of engagement/ disengagement
Drop	1.22 meters onto wooden platform
Thermal Shock	5 Cycles from -40°C to +125°C
Mechanical Shock	50g in each of 3 mutually perpendicular axis
Fluid Compatibility	Gasoline, diesel fuel, motor oil, antifreeze, brake fluid, ATF

*Max. Current Indication

The information listed as Max. current indication is to be used as a guideline only. The maximum allowable rating of the fuses used depends on design criteria such as maximum current, nominal current the duration for which the circuits are energized, as well as external factors as ambient temperature. All modules should therefore be tested as an assembly, and users should make their own evaluation to determine the suitability of the product for their specific applications.

Mechanische Festigkeit für jeden

POWR-BLOKS™-Module werden aus glasfaserverstärktem Polyamid hergestellt - das gewährleistet Dimensionsstabilität, ausgezeichnete Steifigkeit, Widerstandsfähigkeit gegenüber hohen und niedrigen Temperaturen sowie Zugfestigkeit:

Prüfung	POWR-BLOKS™ Standard
Nennspannung	48VDC
Temperaturbereich	-40°C bis +125°C
Haltbarkeit	Mindestens 50 Mal Einsetzen/Lösen
Fall	Fall aus 1,22 m Höhe auf eine Holzplatte
Abrupter Temperaturwechsel	5 Zyklen von -40°C bis +125°C
Mechanische Stöße	50g in jede von 3 zueinander senkrecht verlaufenden Achsen
Chemikalienverträglichkeit	Benzin, Diesel, Motoröl, Frostschutzmittel, Bremsflüssigkeit, ATF

*Max. Stromangabe

Die Max.-Stromangabe ist lediglich als Richtwert zu verstehen. Die maximal zulässigen Nennwerte der verwendeten Sicherungen hängen von Auslegungskriterien wie dem Max.-Strom, dem Nennstrom, der Dauer, während der die Schaltkreise unter Strom stehen, sowie von äußeren Faktoren wie der Umgebungstemperatur ab. Daher sollten alle Module als Baugruppe getestet werden und der Anwender sollte selbst beurteilen, ob das Produkt für seine spezifischen Anwendungen geeignet ist.

Littelfuse POWR-BLOKS™

How to use the Littelfuse POWR-BLOKS system

1. Identify the electrical System Parameters
 - Space availability and requirements
 - Circuit Protection components
 - Relay and Flasher components
 - Components for special needs
2. Select the Littelfuse POWR-BLOKS components. Lay out the electrical panel as designed. Then determine the appropriate type and quantity of POWR-BLOKS modules, BLOK LOKS and TERMINAL LOKS you need.
3. Build the panel by row. POWR-BLOKS can be assembled without special tools. Assemble the block from the rear by placing all modules face down on a flat surface. POWR-BLOKS should be designed by row, either going across or up and down.
4. Use BLOK LOKS to interconnect modules. BLOK LOKS are used to connect and stack POWR-BLOKS modules. Press together a row of modules and insert green BLOK LOKS until they snap into place. Repeat this procedure to interlock all assembled rows.
5. Add mounting modules. Once a POWR-BLOKS panel is assembled, add mounting modules that are most suitable for your application. Mounting options include surface mounting legs, a side mounting bracket and a mounting module with three different sized spacers.
6. Plug in terminated wiring. Wire your POWR-BLOKS panel and plug in the terminated wires, then insert the optional matching TERMINAL LOKS devices. Littelfuse TERMINAL LOKS are designed to fit special POWR-BLOKS modules and inserted in the same manner as BLOK LOKS.

The information and illustrations given in this catalogue are believed to be reliable and accurate. Littelfuse makes no warranties as to their accuracy or completeness, and disclaims any liability in connection with their use. Littelfuse's only obligations are those in the standard terms of sale for this product and Littelfuse will not be liable for any consequential or other damages arising out of the use or misuse of this product. Littelfuse reserves the right to make changes to the contents hereof without notice. It is suggested that at the time of inquiry Littelfuse Sales personnel be contacted directly for verification of published specifications and product availability.

Wie das POWR-BLOKS-System von Littelfuse eingesetzt wird

1. Ermitteln Sie die elektrischen Systemparameter
 - Zur Verfügung stehender Platz und allg. Anforderungen
 - Schaltschutzkomponenten
 - Relais- und Blinkerkomponenten
 - Komponenten für Spezialanforderungen
2. Wählen Sie die POWR-BLOKS-Komponenten von Littelfuse aus. Ordnen Sie die Schalttafel entsprechend der Projektierung an. Dann ermitteln Sie die jeweilige Art und Anzahl von POWR-BLOKS-Modulen, BLOK LOKS und TERMINAL LOKS, die Sie benötigen.
3. Bauen Sie die Tafel reihenweise auf. POWR-BLOKS können ohne Spezialwerkzeug montiert werden. Montieren Sie den Block von der Rückseite aus, indem Sie alle Module mit der Vorderseite nach unten auf eine ebene Fläche legen. POWR-BLOKS sollten reihenweise – und zwar entweder von rechts nach links oder von oben nach unten verlaufend – ausgelegt werden.
4. Verbinden Sie die Module untereinander mit Hilfe von BLOK LOKS. BLOK LOKS kommen zum Einsatz, um POWR-BLOKS Module zu verbinden und zu stapeln. Drücken Sie eine Reihe von Modulen zusammen und führen Sie grüne BLOK LOKS ein bis sie einrasten. Wiederholen Sie diesen Vorgang, um alle montierten Reihen untereinander zu verbinden.
5. Ergänzen Sie Montagemodule. Sobald eine POWR-BLOKS Tafel bestückt ist, fügen Sie die Montagemodule hinzu, die für Ihren jeweiligen Anwendungsbereich am besten geeignet sind. Möglich sind Pfosten zur Oberflächenmontage, ein Halter zur seitlichen Montage und ein Montagemodule mit drei Distanzstücken unterschiedlicher Größe.
6. Stecken Sie die mit Klemmen versehenen Kabel ein. Verdrahten Sie Ihre POWR-BLOKS Tafel und stecken die mit Klemmen versehenen Kabel ein, dann setzen Sie gegebenenfalls die passenden TERMINAL LOKS ein. TERMINAL LOKS von Littelfuse sind für spezielle POWR-BLOKS-Module ausgelegt und werden genauso wie BLOK LOKS eingesetzt.

Informationen und Abbildungen in diesem Katalog gelten als zuverlässig und richtig. Littelfuse gibt allerdings keine Garantie für deren Richtigkeit oder Vollständigkeit und lehnt jegliche Haftung für deren Gebrauch ab. Die einzigen Verpflichtungen von Littelfuse ergeben sich aus den üblichen Verkaufsbedingungen für dieses Produkt und Littelfuse ist nicht für Folge- oder sonstige Schäden haftbar, die aus dem Gebrauch oder Missbrauch dieses Produkts entstehen. Littelfuse behält sich das Recht auf inhaltliche Änderungen hieran vor. Es wird empfohlen, sich zum Zeitpunkt der Anfrage direkt mit Verkaufsmitarbeitern von Littelfuse in Verbindung zu setzen, um veröffentlichte Spezifikationen und die Verfügbarkeit von Produkten zu überprüfen.

Fuse Modules



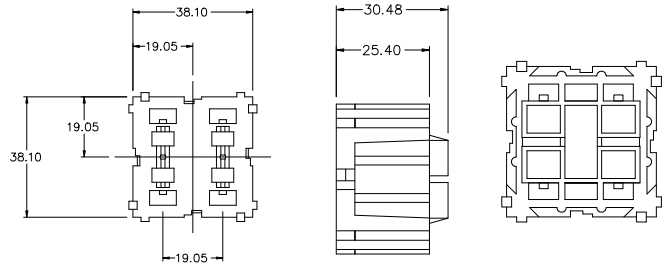
<i>2-Position ATO® Style Fuse/Circuit Breaker Module</i>	121
<i>4-Position ATO® Style Fuse/Circuit Breaker Module</i>	121
<i>7-Position ATO® Style Fuse/Circuit Breaker Module</i>	122
<i>4-Position MINI® Style Fuse Module</i>	122
<i>6-Position MINI® Style Fuse Module</i>	123
<i>8-Position MINI® Style Fuse Module</i>	123
<i>2-Position MAXI™ Style Fuse Module</i>	124
<i>4-Position MAXI™ Style Fuse Module</i>	124

2-Position ATO® Style Fuse and Circuit Breaker Module

RoHS



Dimensions in mm / Maße in mm



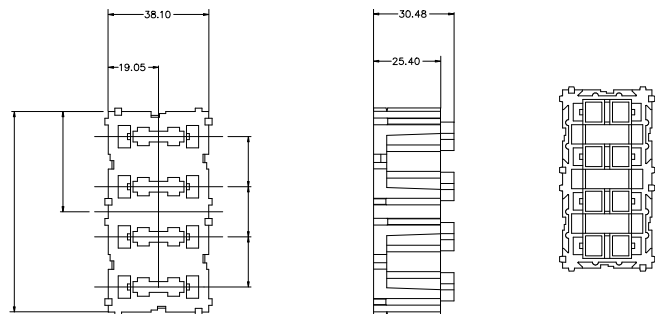
Part Number / Artikel-Nr.	Max. Current Indication Maximalstrom ca.	Terminals / Kontakte (see according section) (siehe entsprechendes Kapitel)	Terminal Loks / Kontaktverriegelungen (see according section) (siehe entsprechendes Kapitel)
03540501Z (40 pcs.)	60A	Type 1 or 7	Type 4, 5 or 6

4-Position ATO® Style Fuse and Circuit Breaker Module

RoHS



Dimensions in mm / Maße in mm



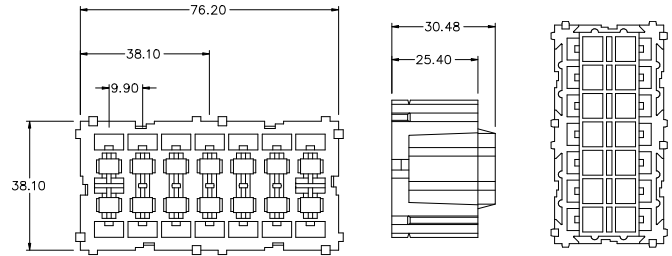
Part number / Artikel-Nr.	Max. current. Indication Maximalstrom ca.	Terminals / Kontakte (see according section) (siehe entsprechendes Kapitel)	Terminal loks / Kontaktverriegelungen (see according section) (siehe entsprechendes Kapitel)
03540502Z (20 pcs.)	120A	Type 1 or 7	Type 4, 5, 6 or 7

7-Position ATO® Style Fuse and Circuit Breaker Module

RoHS



Dimensions in mm / Maße in mm



Part Number / Artikel-Nr.	Max. Current Indication Maximalstrom ca.	Terminals / Kontakte (see according section) (siehe entsprechendes Kapitel)	Terminal Loks / Kontaktverriegelungen (see according section) (siehe entsprechendes Kapitel)
03540503Z (20 pcs.)	120A	Type 1 or 7	Type 4 or 5

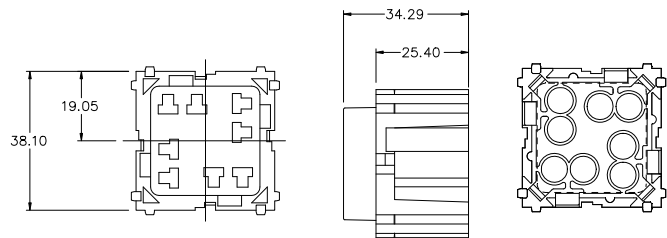
4-Position MINI® Style Fuse Module

RoHS

Fuse Modules



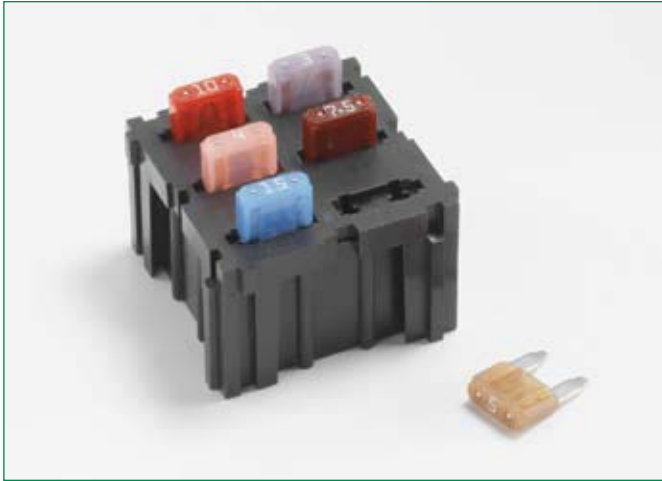
Dimensions in mm / Maße in mm



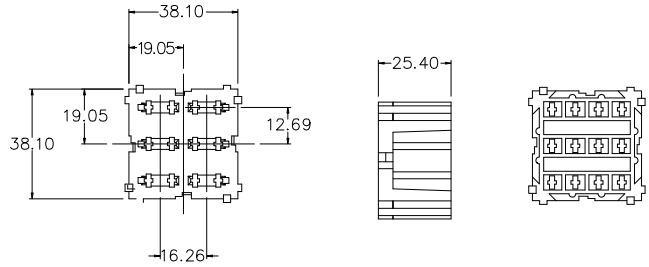
Part Number / Artikel-Nr.	Max. Current Indication Maximalstrom ca.	Terminals / Kontakte (see according section) (siehe entsprechendes Kapitel)	Terminal Loks / Kontaktverriegelungen (see according section) (siehe entsprechendes Kapitel)
03540532Z (40 pcs.)	60A	Type 6	-

6-Position MINI® Style Fuse Module

RoHS



Dimensions in mm / Maße in mm



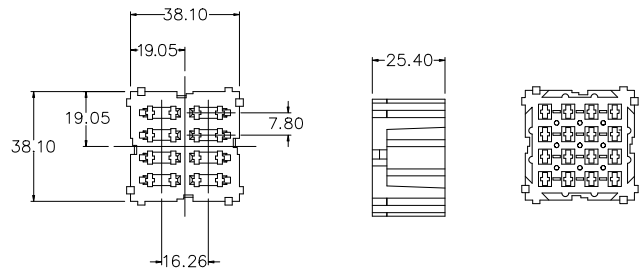
Part Number / Artikel-Nr.	Max. Current Indication Maximalstrom ca.	Terminals / Kontakte (see according section) (siehe entsprechendes Kapitel)	Terminal Loks / Kontaktverriegelungen (see according section) (siehe entsprechendes Kapitel)
03540543Z (40 pcs.)	60A	Type 8	-

8-Position MINI® Style Fuse Module

RoHS



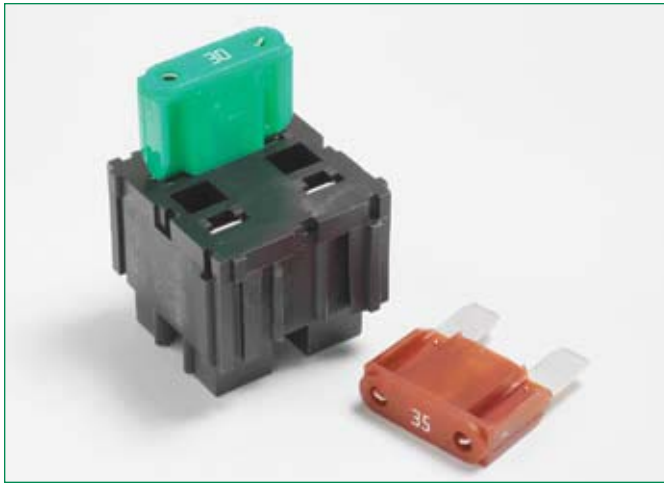
Dimensions in mm / Maße in mm



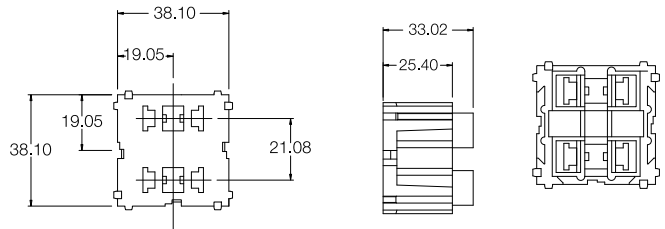
Part Number / Artikel-Nr.	Max. Current Indication Maximalstrom ca.	Terminals / Kontakte (see according section) (siehe entsprechendes Kapitel)	Terminal Loks / Kontaktverriegelungen (see according section) (siehe entsprechendes Kapitel)
03540544Z (40 pcs.)	60A	Type 8	-

2-Position MAXI™ Style Fuse Module

RoHS



Dimensions in mm / Maße in mm



Part Number / Artikel-Nr.	Max. Current Indication Maximalstrom ca.	Terminals / Kontakte (see according section) (siehe entsprechendes Kapitel)	Terminal Loks / Kontaktverriegelungen (see according section) (siehe entsprechendes Kapitel)
03540549Z (40 pcs.)	80A	Type 2	Type 8

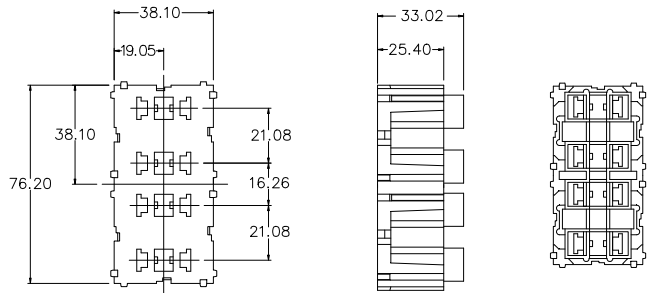
4-Position MAXI™ Style Fuse Module

RoHS

Fuse Modules



Dimensions in mm / Maße in mm



Part Number / Artikel-Nr.	Max. Current Indication Maximalstrom ca.	Terminals / Kontakte (see according section) (siehe entsprechendes Kapitel)	Terminal Loks / Kontaktverriegelungen (see according section) (siehe entsprechendes Kapitel)
03540505Z (20 pcs.)	160A	Type 2	Type 8

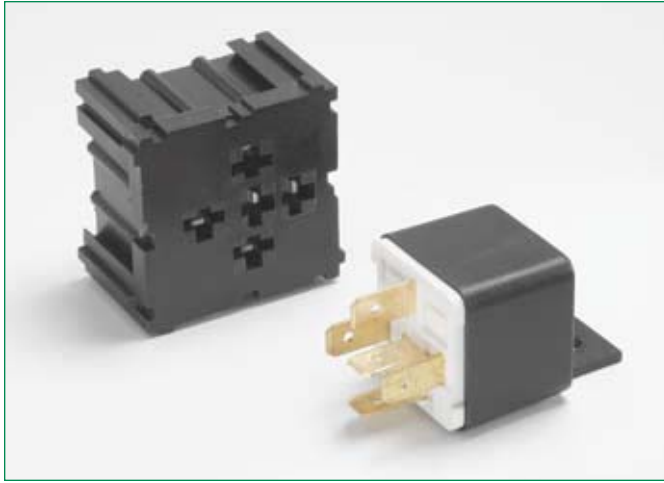
Relay Modules



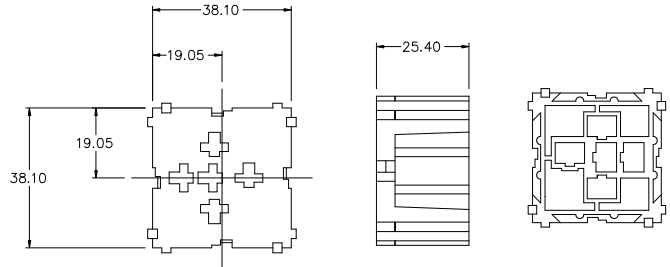
<i>1-Position ISO Relay Module</i>	126
<i>2-Position ISO Relay Module</i>	126
<i>3-Position Micro Relay Module</i>	127
<i>1-Position 9-Pin ISO Relay Module</i>	127
<i>2-Position 280 Micro Relay + 2-Position MINI® Fuse</i>	128
<i>1-Position Power Relay Module</i>	128
<i>2-Pin Flasher Module</i>	129

1-Position ISO Relay Module Alternative for: 3 pin flasher module

RoHS



Dimensions in mm / Maße in mm

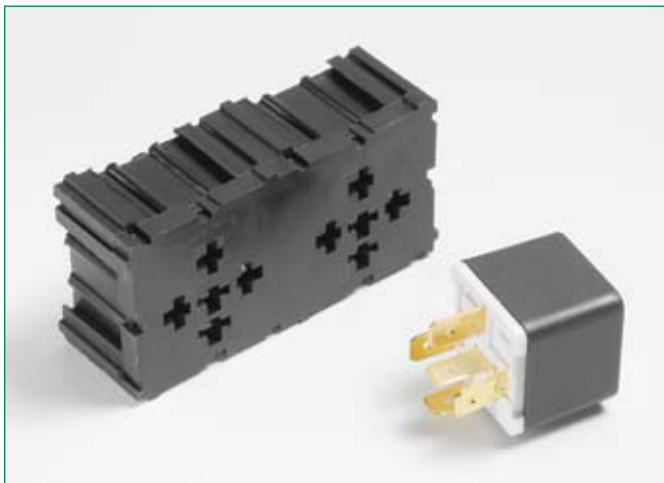


Part Number / Artikel-Nr.	Remarks / Bemerkungen	Terminals / Kontakte (see according section) (siehe entsprechendes Kapitel)	Terminal Loks / Kontaktverriegelungen (see according section) (siehe entsprechendes Kapitel)
03540506Z (40 pcs.)	–	Type 3	Type 1

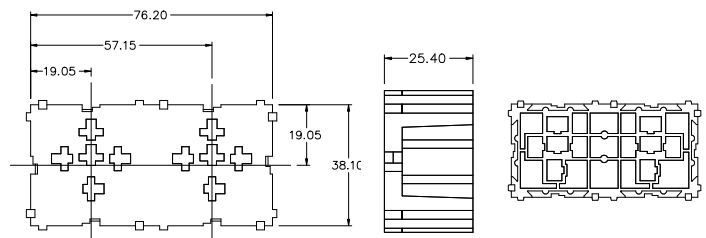
2-Position ISO Relay Module Alternative for: 3 pin flasher module

RoHS

Relay Modules



Dimensions in mm / Maße in mm



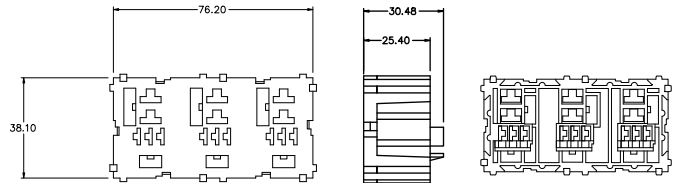
Part Number / Artikel-Nr.	Remarks / Bemerkungen	Terminals / Kontakte (see according section) (siehe entsprechendes Kapitel)	Terminal Loks / Kontaktverriegelungen (see according section) (siehe entsprechendes Kapitel)
03540536Z (20 pcs.)	–	Type 3	Type 1

3-Position Micro Relay Module

RoHS



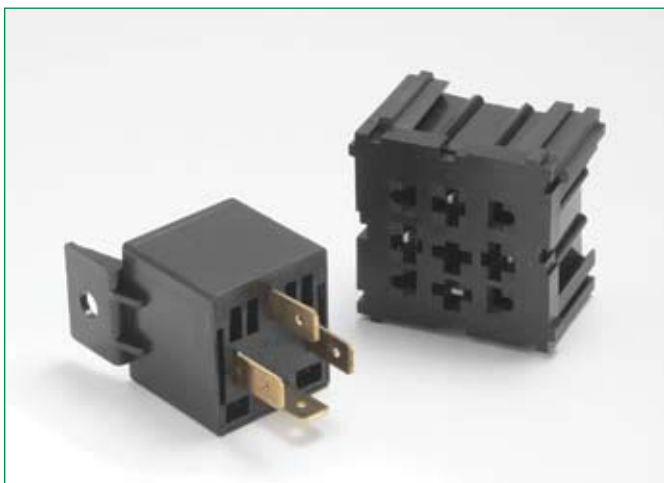
Dimensions in mm / Maße in mm



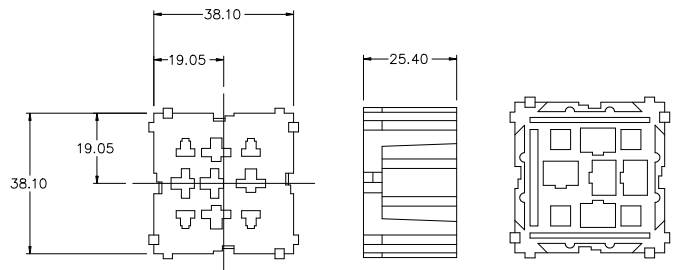
Part Number / Artikel-Nr.	Remarks / Bemerkungen	Terminals / Kontakte (see according section) (siehe entsprechendes Kapitel)	Terminal Loks / Kontaktverriegelungen (see according section) (siehe entsprechendes Kapitel)
03540507Z (20 pcs.)	Coil and normally closed contacts Spule und Kontakte (normalerweise geschlossen)	Type 5	Type 3
03540507Z (20 pcs.)	Normally open contacts Kontakte normalerweise offen	Type 3	Type 2

1-Position 9 Pin Relay Module

RoHS



Dimensions in mm / Maße in mm



Part Number / Artikel-Nr.	Remarks / Bemerkungen	Terminals / Kontakte (see according section) (siehe entsprechendes Kapitel)	Terminal Loks / Kontaktverriegelungen (see according section) (siehe entsprechendes Kapitel)
03540542Z (40 pcs.)	5 "Inner" pins / 5 Innenkontakte	Type 3	Type 1
03540542Z (40 pcs.)	4 "Outer" pins / 4 Aussenkontakte	Type 6	-

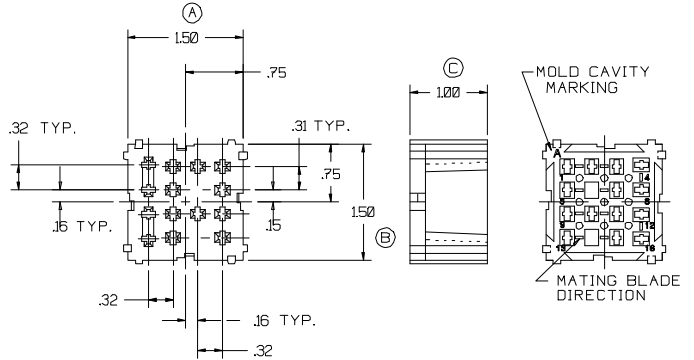
Relay Modules

2-Position 280 Micro Relay + 2 Position MINI® Style Fuse

RoHS



Dimensions in mm / Maße in mm



Part Number / Artikel-Nr.	Remarks / Bemerkungen	Terminals / Kontakte (see according section) (siehe entsprechendes Kapitel)	Terminal Loks / Kontaktverriegelungen (see according section) (siehe entsprechendes Kapitel)
03540551Z (40 pcs.)	Max. current indication 30A	Type 8	-

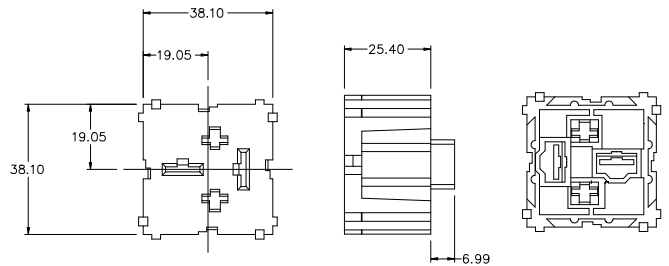
1-Position Power Relay Module

RoHS

Relay Modules



Dimensions in mm / Maße in mm



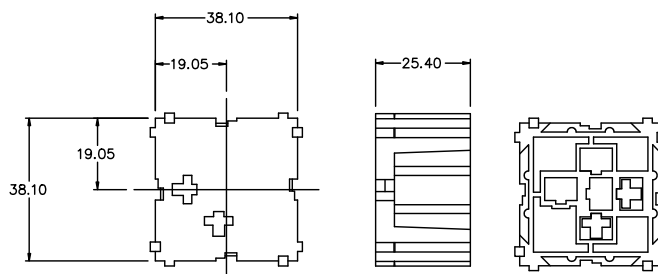
Part Number / Artikel-Nr.	Remarks / Bemerkungen	Terminals / Kontakte (see according section) (siehe entsprechendes Kapitel)	Terminal Loks / Kontaktverriegelungen (see according section) (siehe entsprechendes Kapitel)
03540535Z (40 pcs.)	Coil / Spule	Type 3	Type 1
03540535Z (40 pcs.)	Contacts / Kontakte	Type 4	-

Flasher Module (2-Pin)

RoHS



Dimensions in mm / Maße in mm



Part Number / Artikel-Nr.	Remarks / Bemerkungen	Terminals / Kontakte (see according section) (siehe entsprechendes Kapitel)	Terminal Loks / Kontaktverriegelungen (see according section) (siehe entsprechendes Kapitel)
03540508Z (40 pcs.)	–	Type 3	Type 1

Specialty Modules



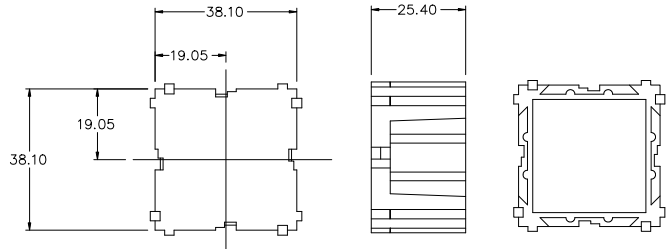
<i>Blank Module</i>	131
<i>2-position Blank Module</i>	131
<i>Power Tap Module, M8</i>	132
<i>2-Stud Assembly Module, M6</i>	132
<i>4-Stud Assembly Module, M6</i>	133
<i>2-position Push Button Circuit Breaker Module</i>	133
<i>Storage Module</i>	134
<i>Storage Drawer Insert</i>	134
<i>Splash Proof Cover for MINI® Fuse Module</i>	134
<i>Retainer Lock for MINI Fuse Module</i>	134
<i>Splash Proof Seal for MINI Fuse Module</i>	134

Blank Module

RoHS



Dimensions in mm / Maße in mm



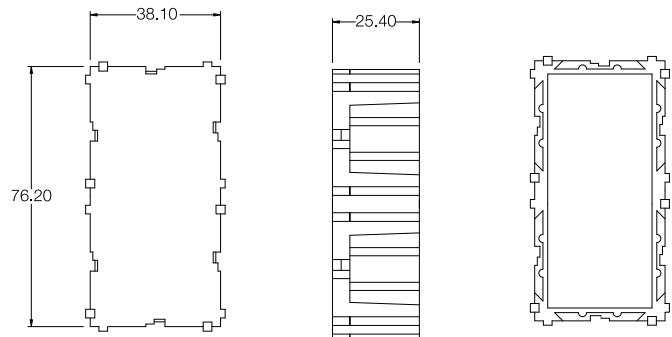
Part Number / Artikel-Nr.	Remarks / Bemerkungen
03540520Z (40 pcs.)	-

2-Position Blank Module

RoHS



Dimensions in mm / Maße in mm



Part Number / Artikel-Nr.	Remarks / Bemerkungen
03540550Z (20 pcs.)	-

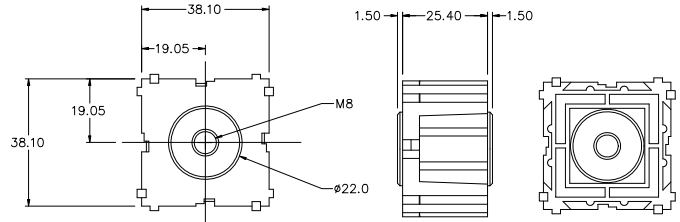
Specialty Modules

Power Tap Module

RoHS



Dimensions in mm / Maße in mm



Part Number / Artikel-Nr.	Remarks / Bemerkungen
03540539Z (40 pcs.)	M8 Tread Metric / M8 Gewinde, metrisch
03540512Z (100 pcs.)	1/4 inch - 20 thread / 1/4 Inch - 20 Gewinde
03540513Z (100 pcs.)	5/16 inch - 18 thread / 5/16 Inch - 18 Gewinde

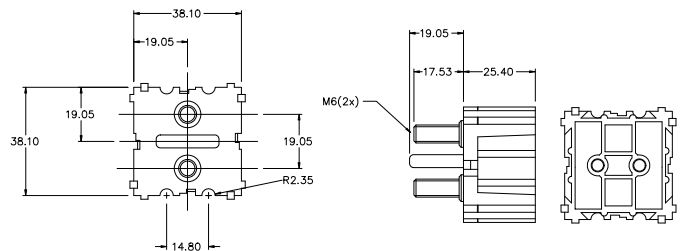
Stud Assembly Module (2-stud)

RoHS

Specialty Modules



Dimensions in mm / Maße in mm



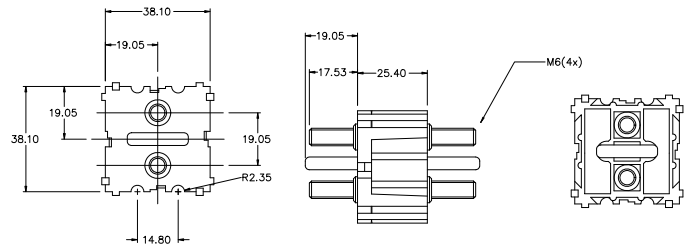
Part Number / Artikel-Nr.	Remarks / Bemerkungen
03540537Z (20 pcs.)	M6 Thread, Metric / M6 Gewinde, metrisch
03540509Z (100 pcs.)	10-32 thread / 10-32 Gewinde

Stud Assembly Module (4-stud)

RoHS



Dimensions in mm / Maße in mm



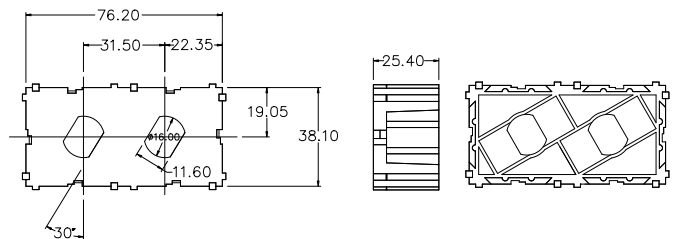
Part Number / Artikel-Nr.	Remarks / Bemerkungen
03540538Z (20 pcs.)	M6 Thread Metric / M6 Gewinde, metrisch
03540510Z (100 pcs.)	10-32 thread / 10-32 Gewinde

2-Position Push Button Circuit Breaker Module

RoHS



Dimensions in mm / Maße in mm



Part Number / Artikel-Nr.	Remarks / Bemerkungen
03540504Z (20 pcs.)	—

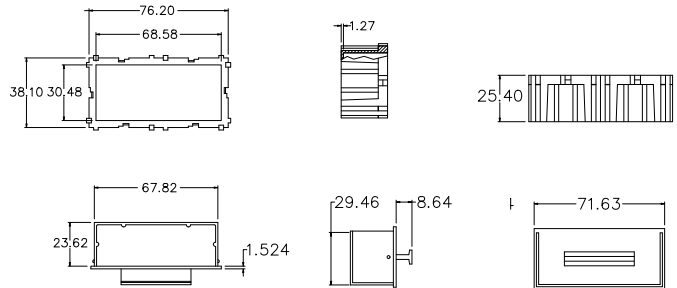
Specialty Modules

Storage Module/Drawer Insert

RoHS



Dimensions in mm / Maße in mm



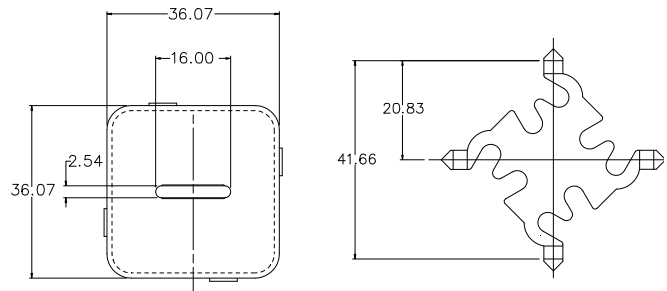
Part Number / Artikel-Nr.	Remarks / Bemerkungen
03540521Z (20 pcs.)	Body / Gehäuse
03540522Z (20 pcs.)	Drawer / Schublade

Splash Proof Cover for: 4-Position MINI® Fuse Module

RoHS



Dimensions in mm / Maße in mm



Part Number / Artikel-Nr.	Remarks / Bemerkungen
03540534Z (20 pcs.)	Cover / Abdeckung
03540533Z (20 pcs.)	Lock / Verriegelung
09130085Z (20 pcs.)	Seal / Dichtung

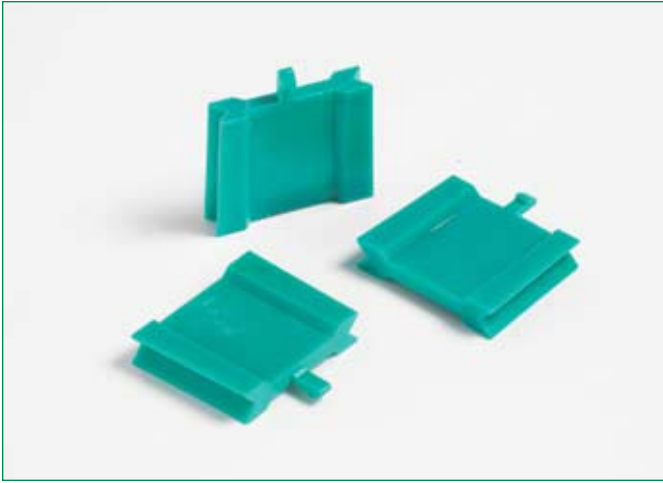
Assembly/Mounting Accessories



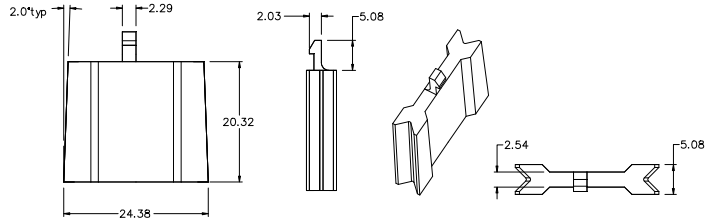
<i>BLOK LOKS™</i>	136
<i>Mounting Standoff, 0.75 inch/19mm</i>	136
<i>Mounting Standoff, 1 inch/25.4mm</i>	136
<i>Mounting Standoff, 1.25 inch/31.7mm</i>	136
<i>Mounting Leg, 2.5 inch/63.5mm</i>	137
<i>Mounting Module</i>	137
<i>Mounting Leg, 3 inch/76.2mm</i>	137
<i>Flush Mounting Leg</i>	138
<i>Side Mounting Bracket</i>	138

Assembly Accessories - BLOK LOKS™

RoHS



Dimensions in mm / Maße in mm



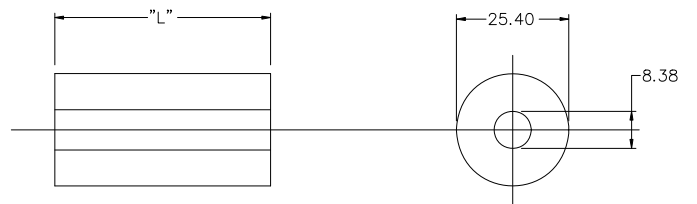
Part Number / Artikel-Nr.	Remarks / Bemerkungen
03540523Z (250 pcs.)	—

Mounting Accessories - Mounting Standoffs

RoHS



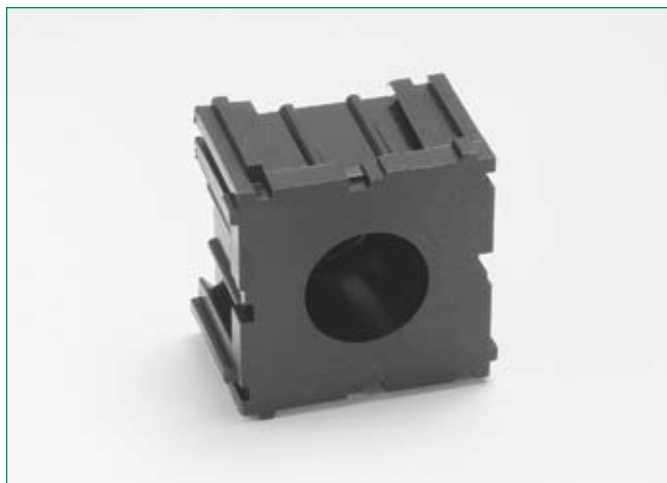
Dimensions in mm / Maße in mm



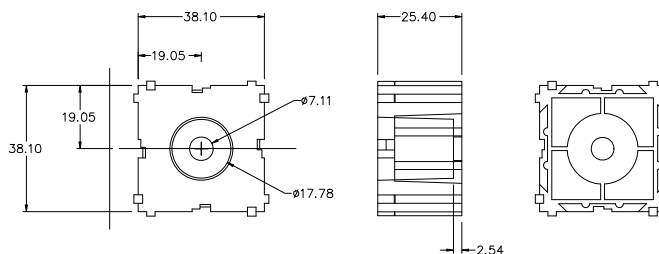
Part Number / Artikel-Nr.	Remarks / Bemerkungen
03540515Z (10 pcs.)	0.75 Inch / 19mm
03540516Z (10 pcs.)	1 Inch / 25.4mm
03540517Z (10 pcs.)	1.25 Inch / 31.7mm

Mounting Accessories - Mounting Module

RoHS



Dimensions in mm / Maße in mm



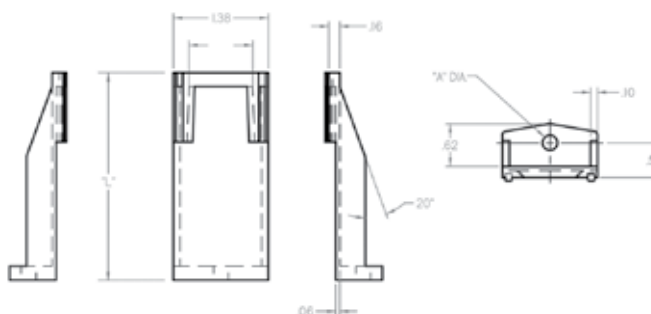
Part Number / Artikel-Nr.	Remarks / Bemerkungen
03540514Z (40 pcs.)	-

Mounting Leg

RoHS



Dimensions in mm / Maße in mm



Part Number / Artikel-Nr.	Remarks / Bemerkungen
03540541Z (50 pcs.)	2.50 Inch / 63.5mm
03540518Z (50 pcs.)	3 Inch / 76.2mm

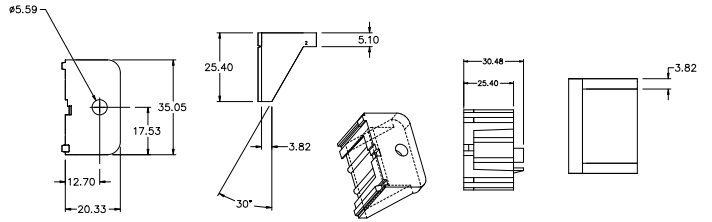
Assembly/Mounting Accessories

Mounting Accessories - Flush Mounting Leg

RoHS



Dimensions in mm / Maße in mm



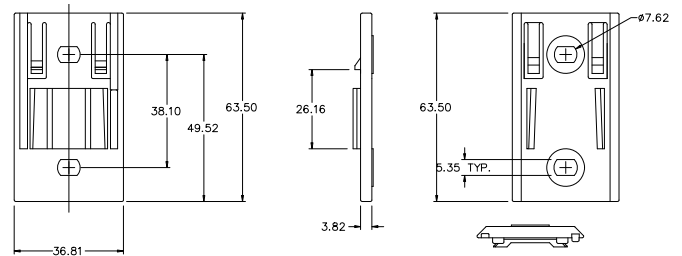
Part Number / Artikel-Nr.	Remarks / Bemerkungen
03540519Z (50 pcs.)	-

Side Mounting Bracket

RoHS



Dimensions in mm / Maße in mm



Part Number / Artikel-Nr.	Remarks / Bemerkungen
03540540Z (50 pcs.)	-

Assembly/Mounting Accessories

Terminals



<i>Terminal Type 1 Heavy Duty</i>	140
<i>Terminal Type 1 Std</i>	140
<i>Terminal Type 2</i>	141
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<i>Terminal Type 6</i>	143
<i>Terminal Type 7</i>	143
<i>Terminal Type 8</i>	144
<i>Starter Terminals</i>	145

Terminal Type 1

RoHS

Terminal Loks

Description Beschreibung	Wire Diam. Drahtdurchmesser	Type of terminal loks Verriegelungstyp
For part number / für Teilenummer: 354501 / 354502 / 354503	0.50 - 2 mm ²	4
For part number / für Teilenummer: 354501 / 354502 / 354503	0.50 - 2 & 3.3 - 5.3 mm ²	5
For part number / für Teilenummer: 354501 / 354502	0.50 - 2 mm ²	6
For part number / für Teilenummer: 354502	0.50 - 2 mm ²	7

Part Number Teilenummer	Description Beschreibung	Wire Diam. Drahtdurchmesser	Material
913-070 (Reeled/auf Spule per 2200 pcs) 0913070001 (Single per 250 pcs)	Heavy Duty + spring clip* / Schwere Anwendung mit Federclip*	0.5-0.8 mm ² / 18-20AWG 0.5-0.8 mm ² / 18-20AWG	Brass / Messing
913-071 (Reeled/auf Spule per 2200 pcs) 913-071XS (Reeled/auf Spule per 2200 pcs)	Heavy Duty + spring clip* / Schwere Anwendung mit Federclip*	1.33-2.09 mm ² / 14-16AWG 1.33-2.09 mm ² / 14-16AWG	Brass / Messing Silver plated Copper / Kupfer, versilbert
0913071001 (Single per 250 pcs) 913-072 (Reeled/auf Spule per 2200 pcs)	Heavy Duty + spring clip* / Schwere Anwendung mit Federclip*	1.33-2.09 mm ² / 14-16AWG 3.32-5.37 mm ² / 10-12AWG	Brass / Messing
913-072XS (Reeled/auf Spule per 2200 pcs) 0913072001 (Single per 250 pc)	Heavy Duty + spring clip* / Schwere Anwendung mit Federclip*	3.32-5.37 mm ² / 10-12AWG 3.32-5.37 mm ² / 10-12AWG	Silver plated Copper / Kupfer, versilbert Brass / Messing
913-058 (Reeled/auf Spule per 4500 pcs) 0913058001 (Single per 250 pcs)	Standard Duty / Normale Anwendung	0.5-0.8 mm ² / 18-20AWG 0.5-0.8 mm ² / 18-20AWG	Brass / Messing
913-059 (Reeled/auf Spule per 4500 pcs) 0913059001 (Single per 250 pcs)	Standard Duty / Normale Anwendung	1.33-2.09 mm ² / 14-16AWG 1.33-2.09 mm ² / 14-16 AWG	Brass / Messing
913-060 (Reeled/auf Spule per 4500 pcs) 0913060001 (Single per 250 pcs)	Standard Duty / Normale Anwendung	3.32-5.37 mm ² / 10-12AWG 3.32-5.37 mm ² / 10-12AWG	Brass / Messing

* Spring clip material: Stainless steel

Terminal Type 2

RoHS



Terminal Loks

Description Beschreibung	Wire Diam. Drahtdurchmesser	Type of terminal loks Verriegelungstyp
For part number/ für Teilenummer: 354505	0,50 - 2 mm ²	8

Part Number Teilenummer	Description Beschreibung	Wire Diam. Drahtdurchmesser	Material
913-063 (Reeled/auf Spule per 1200 pcs) 0913063001 (Single per 250 pcs)	Female 8,0 mm	0.82-1.33 mm ² / 18-16AWG 0.82-1.33 mm ² / 18-16AWG	Silver plated brass / Messing, versilbert
913-064 (Reeled/auf Spule per 1200 pcs) 0913064001 (Single per 250 pcs)	Female 8,0 mm	2.09-3.32 mm ² / 14-12AWG 2.09-3.32 mm ² / 14-12AWG	Silver plated brass / Messing, versilbert
913-068 (Reeled/auf Spule per 1200 pcs) 0913068001 (Single per 250 pcs)	Female 8,0 mm	5.37mm ² / 10AWG 5.37mm ² / 10AWG	Silver plated brass / Messing, versilbert

Terminal Type 3

RoHS



Terminal Loks

Description Beschreibung	Wire Diam. Drahtdurchmesser	Type of terminal loks Verriegelungstyp
For part number/ für Teilenummer: 354506 / 354508 / 354535 / 354536	–	1
For part number für Teilenummer: 354507	–	2

Part Number Teilenummer	Description Beschreibung	Wire Diam. Drahtdurchmesser	Material
913-053 (Reeled per 2000 pcs) 0913053001 (Single per 250 pcs)	–	0.5-0.8 mm ² / 18-20AWG 0.5-0.8 mm ² / 18-20AWG	Tin plated brass / Messing, verzinkt
913-253 (Reeled per 3000 pcs)	–	0.5-1.00 mm ² (metric)	Tin plated brass / Messing, verzinkt
913-065 (Reeled per 2100 pcs) 0913065001 (Single per 250 pcs)	–	1.33-2.09 mm ² / 14-16AWG 1.33-2.09 mm ² / 14-16AWG	Tin plated brass / Messing, verzinkt
913-265 (Reeled per 2500 pcs)	–	1.1-2.50 mm ² (metric)	Tin plated brass / Messing, verzinkt
913-055 (Reeled per 1900 pcs) 0913055001 (Single per 250 pcs)	–	3.32-5.37 mm ² / 10-12AWG 3.32-5.37 mm ² / 10-12AWG	Tin plated brass / Messing, verzinkt
913-255 (Reeled per 15000 pcs)	–	4.0-6.0 mm ² (metric)	Tin plated brass / Messing, verzinkt

Terminal Type 4

RoHS


Part Number Teilenummer	Description Beschreibung	Wire Diam. Drahtdurchmesser	Material
913-073 (Reeled/auf Spule per 2000 pcs) 0913073001 (Single per 250 pcs)	Female / Weiblich	3.0-6.0 mm ² /10-12AWG 3.0-6.0 mm ² /10-12AWG	Tin plated Brass / Messing, verzinkt
913-074 (Reeled/auf Spule per 1000 pcs) 0913074001 (Single per 250 pcs)	Female / Weiblich	6.0-10.0 mm ² /8-10AWG 6.0-10.0 mm ² /8-10AWG	Tin plated Brass / Messing, verzinkt

Terminal Type 5

RoHS

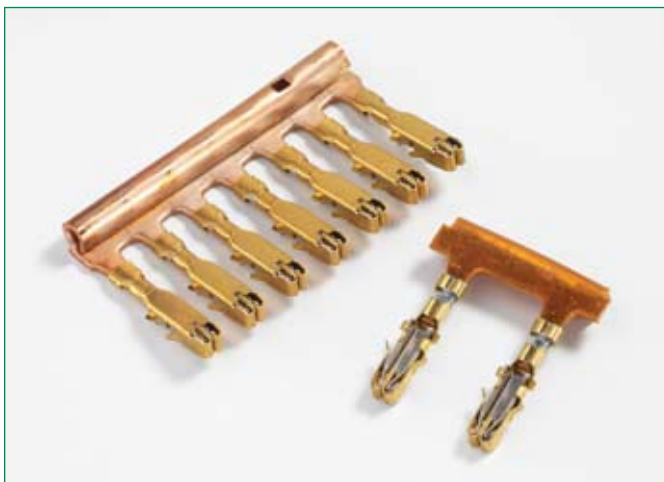

Part Number Teilenummer	Description Beschreibung	Wire Diam. Drahtdurchmesser	Material
913-067 (Reeled/auf Spule per 3500 pcs) 0913067001 (Single per 250 pcs)	Female / Weiblich	0.82-1.33 mm ² /16-18AWG 0.82-1.33 mm ² /16-18AWG	Tin plated silicon bronze / verzinnnte Silikat-Bronze
913-066 (Reeled/auf Spule per 3000 pcs) 0913066001 (Single per 250 pcs)	Female / Weiblich	2.09-3.32 mm ² /12-14AWG 2.09-3.32 mm ² /12-14AWG	Tin plated silicon bronze / verzinnnte Silikat-Bronze

Terminal Type 6

RoHS


Part Number Teilenummer	Description Beschreibung	Wire Diam. Drahtdurchmesser	Material
913-772 (Reeled/auf Spule per 2500 pcs) 0913772001 (Single per 250 pcs)	Female / Weiblich	0.5-0.8 mm ² /18-20AWG 0.5-0.8 mm ² /18-20AWG	Tin plated brass / Messing, verzinkt
913-773 (Reeled/auf Spule per 2500 pcs) 0913773001 (Single per 250 pcs)	Female / Weiblich	1.33-2.09 mm ² /14-16AWG 1.33-2.09 mm ² /14-16 AWG	Tin plated brass / Messing, verzinkt
913-774 (Reeled/auf Spule per 2000 pcs) 0913774001 (Single per 250 pcs)	Female / Weiblich	3.32-5.37 mm ² /10-12AWG 3.32-5.37 mm ² /10-12AWG	Tin plated brass / Messing, verzinkt

Terminal Type 7

RoHS


Part Number Teilenummer	Description Beschreibung	Wire Diam. Drahtdurchmesser	Material
09130075Z (Per 20 pcs)	Bus bar 2 position / Stromschiene mit 2 Anschlüssen	5.0-8.0 mm ² /8-10AWG	Copper / Kupfer
09130076Z (Per 20 pcs)	Bus bar 4 position / Stromschiene mit 4 Anschlüssen	5.0-8.0 mm ² /8-10AWG	Copper / Kupfer
09130077Z (Per 20 pcs)	Bus bar 7 position / Stromschiene mit 7 Anschlüssen	5.0-8.0 mm ² /8-10AWG	Copper / Kupfer

Terminal Type 8
RoHS


Part Number Teilenummer	Description Beschreibung	Wire Diam. Drahtdurchmesser	Material
913-769 (Reeled/auf Spule per 4200 pcs) 0913769001 (Single per 250 pcs)	Female / Weiblich	0.5-1.0 mm ² 0.5-1.0 mm ²	Part.Gold plated Brass /
913-770 (Reeled/auf Spule per 3500 pcs) 0913770001 (Single per 250 pcs)	Female / Weiblich	1.5-2.5 mm ² 1.5-2.5 mm ²	Tin plated bronze / verzinnte Bronze

Starter Terminals

RoHS


The starter terminal series are cable lugs for heavy-duty applications such as starter motors and battery connections.

Die Starter-Terminal-Serie enthält Kabelschuhe/-klemmen für Hochleistungs-Anwendungen wie Starter-und Batterieverbindungen.

Part Number Teilenummer	mm ²	Mounting Hole Montageloch	Width / Breite mm	Material	Plating	Ref.
09130633LXN (50 pcs) 09130633Z (1250 pcs)	2.5-6.0	6.5 mm	11	Cu	Sn	2906
09130634LXN (50 pcs) 09130634Z (600 pcs)	6.0-15	8.4 mm	15	Cu	Sn	2910
09130635LXN (50 pcs) 09130635Z (400 pcs)	10 -25	8.4 mm	15	Cu	Sn	2916
09130636LXN (50 pcs) 09130636Z (200 pcs)	16-35	10.5 mm	19	Cu	Sn	29025
09130637LXN (50 pcs) 09130637Z (150 pcs)	25-50	10.5 mm	19	Cu	Sn	29035
09130638LXN (50 pcs) 09130638Z (100 pcs)	35-70	10.5 mm	19	Cu	Sn	29050
09130639LXN (50 pcs) 09130639Z (50 pcs)	50-95	13.5 mm	22	Cu	Sn	29070
09130640LXN (50 pcs) 09130640Z (600 pcs)	16	6.4 mm	11	Cu	Sn	2916 HK
09130641LXN (50 pcs) 09130641Z (300 pcs)	25	8.4 mm	15	Cu	Sn	29025 HK
09130642LXN (50 pcs) 09130642Z (200 pcs)	35	8.4 mm	15	Cu	Sn	29035 HK (8.4)
09130643LXN (50 pcs) 09130643Z (150 pcs)	35	10.5 mm	19	Cu	Sn	29035 HK (10.5)
09130644LXN (50 pcs) 09130644Z (100 pcs)	50	8.4 mm	17	Cu	Sn	29050 HK (8.4)
09130645LXN (50 pcs) 09130645Z (125 pcs)	50	10.5 mm	19	Cu	Sn	29050 HK (10.5)
09130646LXN (50 pcs) 09130646Z (75 pcs)	70	10.5 mm	21	Cu	Sn	29070 HK

Terminal Loks



Terminal Lok Type 1 through 8

147

Terminal Loks

RoHS

Terminal Lok type 1



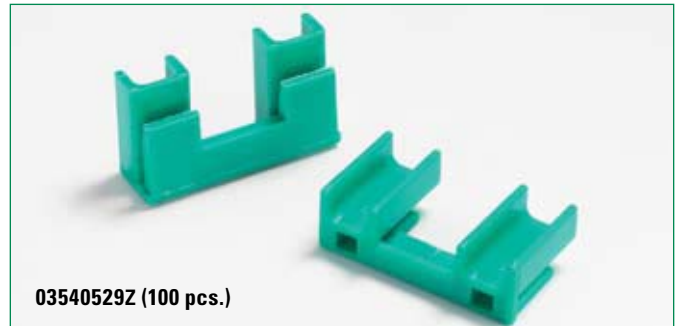
Terminal Lok type 5



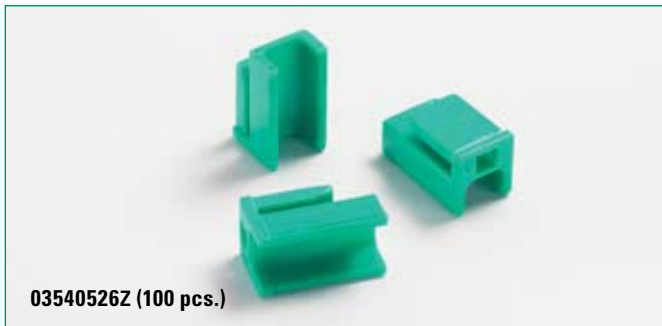
Terminal Lok type 2



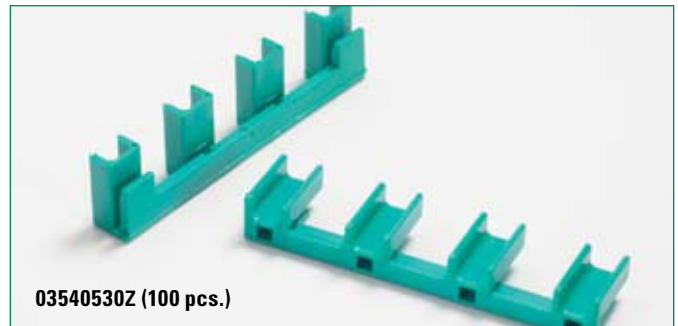
Terminal Lok type 6



Terminal Lok type 3



Terminal Lok type 7



Terminal Lok type 4



Terminal Lok type 8



Blade Type Resistor



FKS Resistors ATO[®] Style

149

FKS Resistor ATO® Style

RoHS

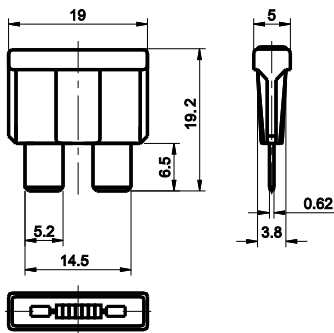











Specifications

Insulating body:	Out of thermoplastic (UL 94-V0, heat-resistant)
Connections:	Blade contacts Copper alloy, gal. Sn Edge-protected
Resistance:	Metal coating resistance 1%, 0.4 W
Packaging unit:	1,000 pieces

ATO-Style FKS-Coding Plug with 0.4 W metal coating resistor 1%. Available resistance 110 Ohms to 9,100 Ohms.

ATO-Style Kodierstecker mit metallisiertem Widerstand (0,4 W, 1%). Erhältlich mit Widerstandswerten von 110 Ohm bis 9.100 Ohm.



Part Number Artikel-Nr.	Resistance Widerstand	Housing Color Kennfarbe	Identification Letter Kennbuchstabe
163.7010.0102	110 Ω		A
163.7010.0152	240 Ω		B
163.7010.0202	430 Ω		C
163.7010.0252	680 Ω		D
163.7010.0302	1,000 Ω		E
163.7010.0352	1,500 Ω		F
163.7010.0402	2,400 Ω		G
163.7010.0452	3,900 Ω		H
163.7010.0502	9,100 Ω		I

Corresponding fuse holders see Section "Fuse Holders."

Fuse Pullers



Pullers
Puller / Tester

151
151

Pullers



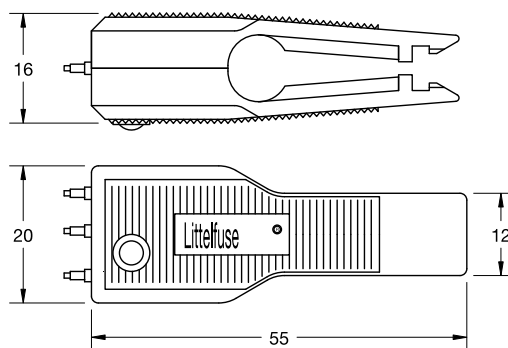
Part Number Artikel-Nr.	Description Bezeichnung
165.0020.000_	ATO® / MINI® / MAXI™ Style
00970021_	ATO® / MINI® Style
00970023_	ATO® / MINI® / Glass Style
00970024_	MINI® Style
00970027_	MAXI™ Style
00970053_	JCASE® Style
00970999_	ATO® Style

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.

Allows for easy fuse removal and replacement.

Erleichtert das Ziehen und Auswechseln von Sicherungen.

Puller / Tester



Part Number Artikel-Nr.	Description Bezeichnung
00970019X	ATO®/MINI® Style

Conveniently and easily tests ATO® and MINI® blade fuses either in or out of the fuse block. Indicator light on tester glows bright green when fuse is good. Fuse puller end allows for easy fuse removal and replacement. 24V maximum.

Ermöglicht eine bequeme und einfache Überprüfung von ATO®- und MINI®-Flachstecksicherungen im eingesteckten (Sicherungskasten) oder gezogenen Zustand. Die Anzeigelampe am Testgerät leuchtet grün auf, wenn die Sicherung in Ordnung ist. Der Sicherungsausheber am Schaftende erleichtert das Ziehen und Auswechseln von Sicherungen. 24V max.

Specialty Products



<i>ATO® Resistor</i>	153
<i>ATO® Diode</i>	153
<i>MINI® Resistor</i>	153
<i>MINI® Diode</i>	153
<i>ATO® Shunt</i>	153
<i>MINI® Shunt</i>	153
<i>JCASE® Shunt</i>	153

Special Products



ATO® Resistor

Part Number: 02400100_ series

Specifications

Operating Temp.: -20°C to +85°C
Resistor Value: Optional
Power Rating: 1/4 W Max
Body Material: Thermoplastic
Term. Material: C.R.S. (Ni/Zn Plated)
Term. Retention: 25 N



ATO® Diode Part Number: 02400103_ (Z = 1500 / LXN = 50)

1 A Diode in ATO® size housing. The cathode connector is rotated 90°

1-A-Diode in ATO®-Größe mit 90°-abgewinkeltem Kathodenanschluss.

Operating Temp.: -40°C to +85°C
Diode Rating: 1.0 A
Max P.I.V.: Optional
Body Material: Thermoplastic
Term. Material: C.R.S. (Ni/Zn Plated)
Term. Retention: 25 N



MINI® Resistor

Part Number: 02400100_ series

Operating Temp.: -40°C to +85°C
Resistor Value: Optional
Power Rating: 1/4 W Max
Body Material: Thermoplastic
Term. Material: C.R.S. (Ni/Zn Plated)
Term. Retention: 25 N



MINI® Diode

Part Number: 02400113_ (P= 2000 / LXN = 50)

Operating Temp.: -40°C to +85°C
Diode Rating: 1.0 A
Max P.I.V.: Optional
Body Material: Thermoplastic
Term. Material: C.R.S. (Ni/Zn Plated)
Term. Retention: 25 N



ATO® Shunt

Part Number: 02400094P (2000 pcs)

Operating Temp.: -40°C to +125°C
Maximum Continuous Load Rating: 35A
Body Material: Thermoplastic (UL 94V0 Rated)
Term. Material: Brass Tin Plated



MINI® Shunt

Part Number: 0297900.WXNV (3000 pcs)

MINI® size shunt for continuous load up to 20A.

Shunt in MINI®-Bauform für Dauerlasten bis 20A.

Operating Temp.: -40°C to +125°C
Maximum Continuous Load Rating: 20A
Body Material: Thermoplastic (UL 94V0 Rated)
Term. Material: Zinc Silver Plated



JCASE® Shunt

Part Number: 0495900.Z

Operating Temp.: -40°C to +125°C
Maximum Continuous Load Rating: 50A
Body Material: Nylon
Term. Material: Copper

Accessories



Cable Ties **155**

Splice Connectors **156**

Cable Ties



Specifications

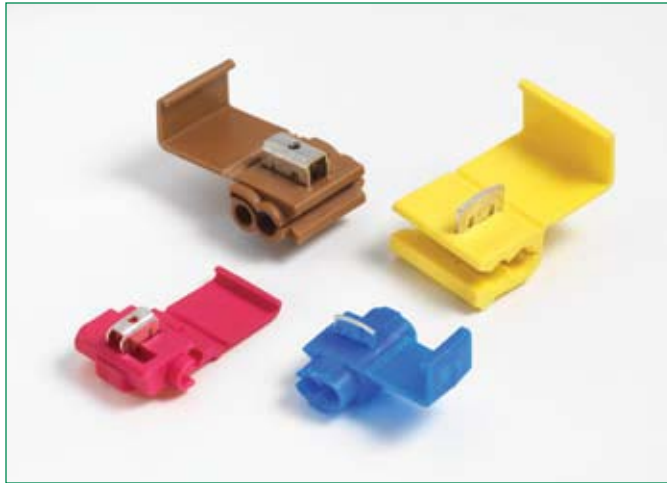
Material:	Nylon 6,6
Flammability rating:	UL94
Black versions:	UV Resistant

Range of multi-purpose cable ties in nylon.

Auswahl an universell verwendbaren Nylon-Kabelbindern.

Part Number Artikel-Nr.	Description Beschreibung	Length (mm) Länge (mm)	Width (mm) Breite (mm)	Strength (kg) Haltekraft (kg)	Max. bundle	Ref.
05800999HXN	White	98	2.5	8	21	W98
05800989HXN	Black	98	2.5	8	21	B98
05800998HXN	White	140	3.6	13	35	W140
05800988HXN	Black	140	3.6	13	35	B140
05800981HXN	White	160	4.5	20	40	W160
05800979HXN	Black	160	4.5	20	40	B160
05800978HXN	White	200	2.6	8	52	W200/26
05800977HXN	Black	200	2.6	8	52	B200/26
05800996HXN	White	200	3.6	13	50	W200/36
05800986HXN	Black	200	3.6	13	50	B200/36
05800991HXN	White	200	4.8	22	50	W200/48
05800992HXN	Black	200	4.8	22	50	B200/48
05800990HXN	Black	240	7.8	55	63	B240
05800995HXN	White	250	4.8	22	68	W250
05800985HXN	Black	250	4.8	22	68	B250
05800982HXN	White	290	3.6	13	80	W290
05800980HXN	Black	290	3.6	13	80	B290
05800994HXN	White	360	4.8	22	103	W360
05800984HXN	Black	360	4.8	22	103	B360
05800976HXN	Black	365	7.8	55	100	B365
05800983HXN	Black	540	7.8	55	158	B540

Connectors 3 M



Specifications

Material: Polypropylene / CuZn
Plating: Sn

Insulation Displacement Connectors.
 Schneidklemm-Steckverbinder (IDC).

Part Number Artikel-Nr.	Ref:	Description Beschreibung
08690903_	1563	Quick splice connector Red
08690900_	1560	Quick splice connector Blue
08690901_	1561	Quick splice connector Brown
08690902_	1562	Quick splice connector Yellow

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.

Connectors



Specifications

Material: Polypropylene / CuZn
Plating: Sn

Insulation Displacement Connectors.
 Schneidklemm-Steckverbinder (IDC).

Trade pack: 50 pcs.	Ref:	Description Beschreibung
08690943_	QS 43	Quick splice connector Red
08690940_	QS 40	Quick splice connector Blue
08690942_	QS 42	Quick splice connector Yellow

Last figure of part number = packaging code, see Section "Packaging Index," pg. 157.

Packaging Index



Series/Serien	Part number extension for available pack sizes/Teilenummern-Zusatz und verfügbare Packungsgrößen											
	10	50	100	200	500	1000	1500	2000	2200	3000	5000	All other
00970019	X											
00970021			HXNVDL								NXVDL	
00970023			HXN		Z							
00970024						M						Z (7500)
00970027		LXN						N				
00970053												Z (1)
00970999								P				
01000057			H								N	
01510001		LXN		F								
01520001	TXN				U							
01520003	TXN				U							
01520900	TXN		H		U							
01520903	TXN				U							
0153000x		LXN			Z							
0153003x											Z	
01550xxx		LXN	Z									
020405xx	TXN			Z								
020406xx	TXN			Z								
020407xx	TXN				Z							
0214xxx		LXN										K (10000)
02400094								P				
024001xx								P				
02400103		LXN					Z					
02400113		LXN						P				
0257xxx		LXN						PXPV				
0259xxx	T					M						
0297xxx		LXN								WXNV		
0297900										WXNV		
0298xxx	TXN				ZX(E)H							
0299xxx	TXN											ZXNV (1200)
03500417	TXN											Z (120)
03500418	TXN											Z (180)
03500419	TXN											Z (150)
03500420	TXN											Z (250)
0495xxx	TXN								Z			
0495900									Z			X (20)
0496xxx												N/A
058009xx			HXN									
0869090x		LXN			U							
0869094x		LXN				M						
0895xxx	TXN							Z				
0897xxx			H								N	
09130550		LXN	Z									
09130653		LXN					Z					
09130654		LXN										
0995xxx									Z			
0997xxx										WXN		
0999xxx												ZXN (1200)
125.6785.xxx		7				2						
142.5631.xxx					2							
142.6185.xxx			6					2				
142.6885.5xx						2						
151.51xx.xxx			3								2	
153.5631.xxx	1					2						

Series/Serien	Part number extension for available pack sizes / Teilenummern-Zusatz und verfügbare Packungsgrößen											
	10	50	100	200	500	1000	1500	2000	2200	3000	5000	All other
153.xxxx												N/A
155.0892.xxx			1									
156.5610.xxx			1					2				
156.5611.xxx		1										
156.5677.xxx			1									2 (10000)
157.5700.xxx		1										
157.5701.xxx		1										
157.5916.xxx		1										
157.5917.xxx		1										
162.6185.xxx			6					2				
162.7049.xxx								2				
163.7010.xxx						2						
164.6185.xxx								2				
165.0020.000					2							
166.6885.5xx	1											
166.7000.xxx			6		2							
168.6585.xxx			6				Z					
168.6785.xxx		7										2 (8000)
169.6885.xxx	1					2						
177.57xx.000	1											
178.4205.xxx						2						
178.4215.xxx						2						
178.4250.xxx						2						
178.4252.xxx						2						
178.4265.xxx					2							
178.6105.xxx			1			2						
178.6115.xxx			1			2						
178.6116.xxx				1		2						
178.6125.xxx			1			2						
178.6150.xxx			1			2						
178.6152.000			1			2						
178.6152.250			1									
178.6165.xxx			1		2							
178.619x.xxx			1									
178.6764.000			1									
178.7017.xxx			1									
192.57xx.000	1											
255.0808.xxx												1 (250)
255.0899.xxx			1									
255.1000.000			1									
255.2000.000		1										
276.5105.xxx			2									
279.6800.xxx	1		2									
298907-030												140
298907-040												270
FHAC0001		LXN				Z						
FHAC0002		LXN										Z (750)
OFHA000x		LXN				Z						
OFHA0200		Z										XBP (10 blister)
OFHM000x		LXN				Z						
OFHM0200		Z										XBP (10 blister)
OMAH0001												Z (1)