DC-ATCO

Direct Current Thermal-Link (Alloy Type)

RPK Series

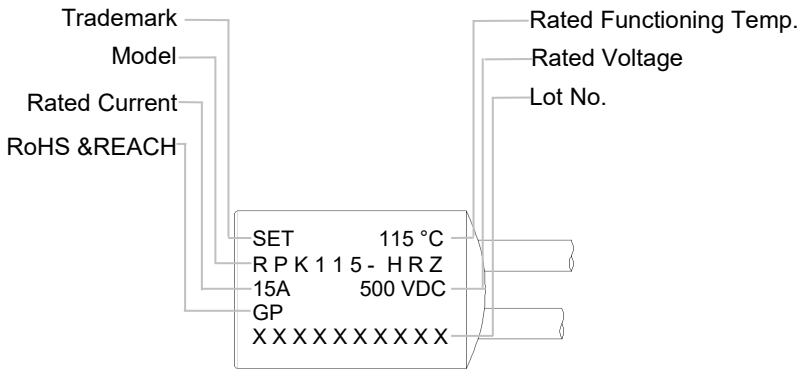
Description

The Direct Current Thermal-Link Alloy Type (DC-ATCO) is a thermal-link that utilizes low melting point alloys, known as the thermal element, which fuse when heated to a specific fusing temperature. This allows for controlled circuit disconnection. The DC-ATCO is composed of various components, including a case, the low melting point alloys (thermal element), flux resin, electrode leads, sealant and stranded conductor.

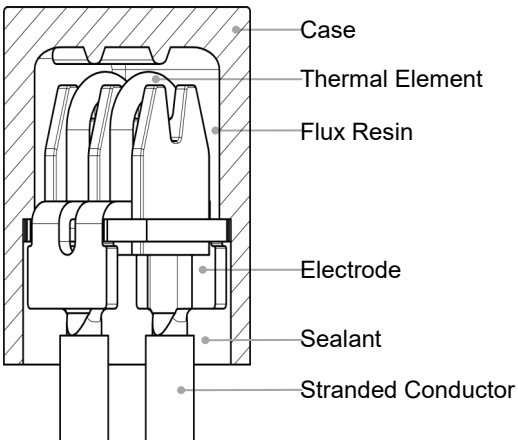
The DC-ATCO is widely employed for over-temperature protection in electrical equipment and electric vehicles. Typically, the low melting point alloys (thermal element) are connected in series between two electrode pins. When the temperature reaches the predetermined fusing temperature of the DC-ATCO, the low melting point alloys (thermal element) melt and swiftly retract to the ends of the two pins, facilitated by the flux resin. This effectively disconnects the circuit.

The SETsafe | SETfuse Direct Current Thermal-Link (Alloy Type) is available in axial and radial shapes, with a rated functioning temperature ranging from 102 °C to 150 °C, rated current 15 A, rated voltage 500 VDC. It is compliant with RoHS and REACH regulations.

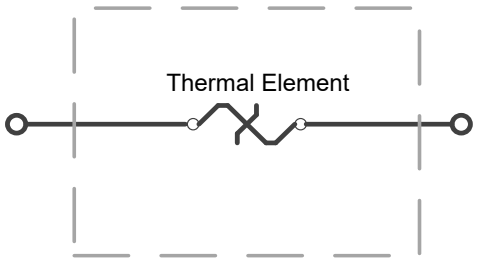
Marking



Structure Diagram



Product Schematic



Features

- 0 to 500 VDC Operating Voltage
- High Accuracy of Functioning Temp.
- Ceramic Case
- Non-Resettable
- RoHS & REACH Compliant

Applications

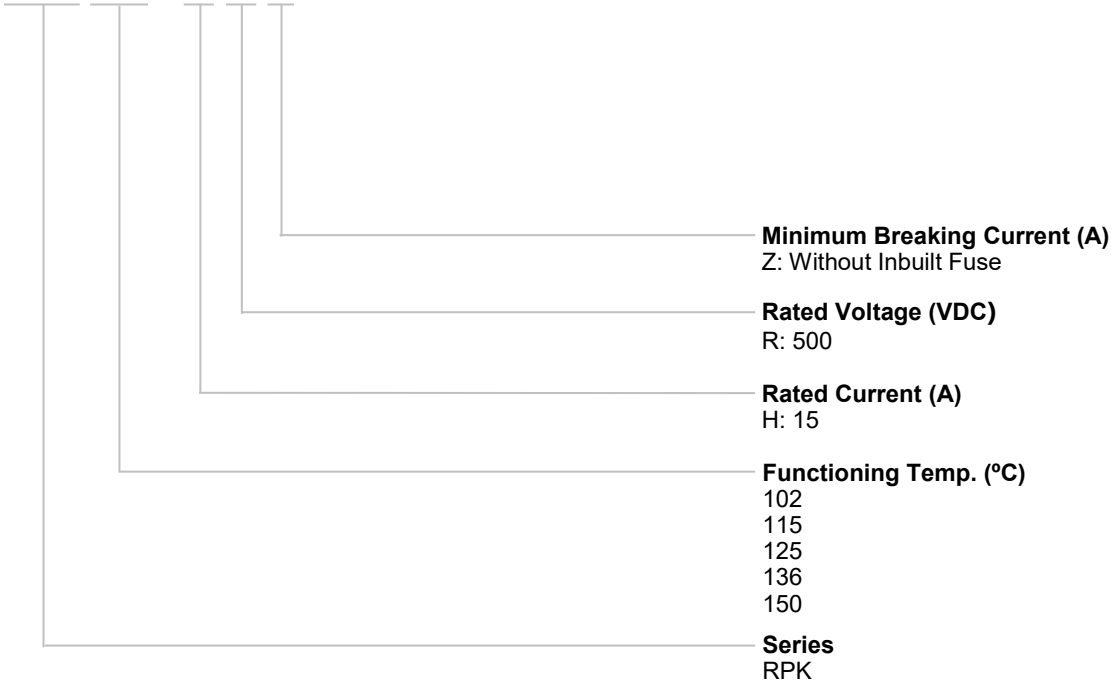
- Battery Cooling Heaters
- Air-Conditioners Heaters
- Pre-charged Resistors
- High Power LED

Customization

- Rated Functioning Temp.
- Stranded Conductor Size

Part Number System

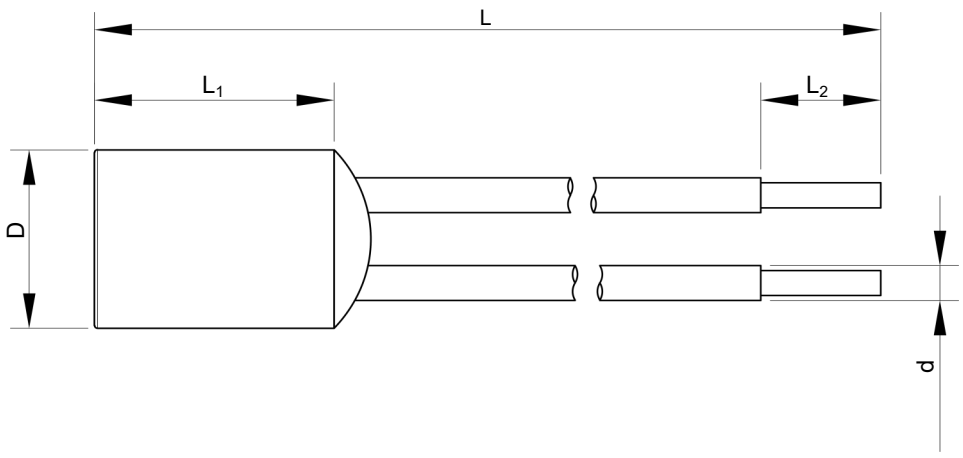
RPK115 - H R Z



Reminder:

Part numbering system in the datasheet is only for selecting correct parameter and product features. Before placing order, please contact us for specifications and use the part number and product code in the specifications to place order to ensure the part is correct. Product code is the unique indentification.

Dimensions (Unit: mm)



L	L_1	L_2	D	d
116.0 ± 5.0	16.0 ± 1.0	10.0 ± 1.0	12.8 ± 0.5	AWG14

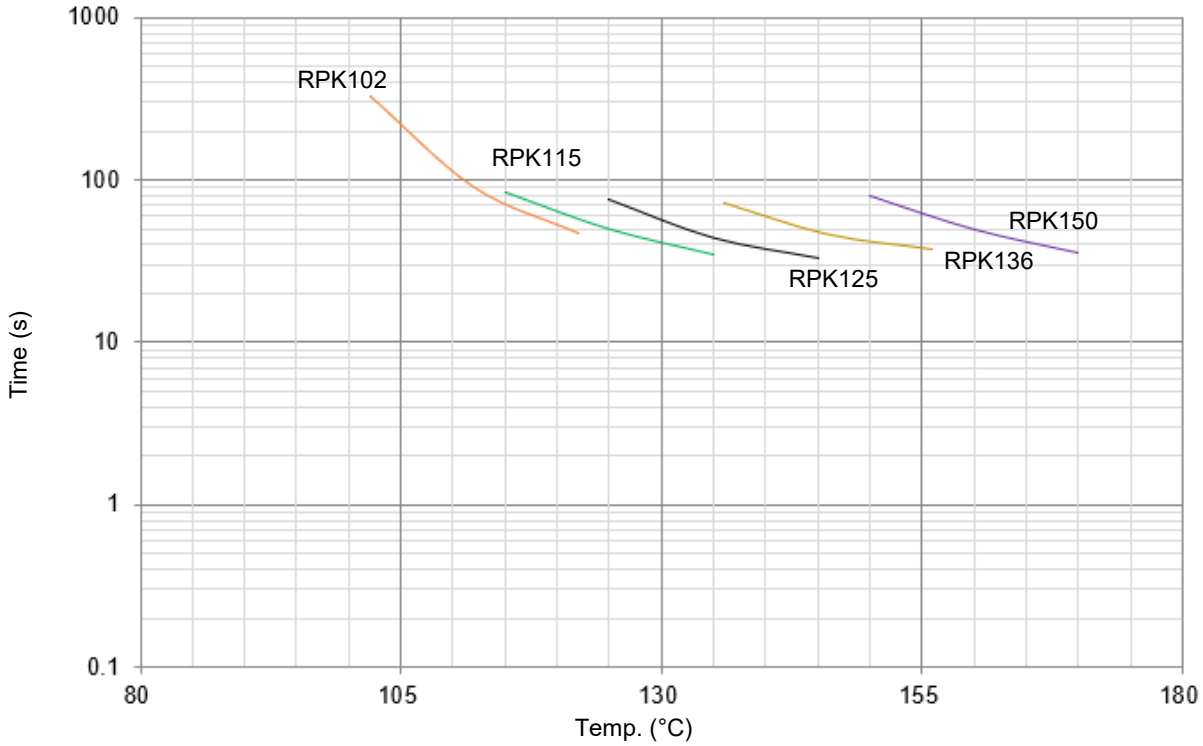
Specifications

Rated Functioning Temp. (T_f) °C	Model	I_r (A)	U_r DC (V)	Rated Functioning Temp. (°C)	T_h (°C)	T_m (°C)	RoHS REACH
150	RPK150-HRZ	15	500	146 ± 3	100	250	●
136	RPK136-HRZ	15	500	131 ± 3	70	250	●
125	RPK125-HRZ	15	500	122 ± 3	85	250	●
115	RPK115-HRZ	15	500	112 ± 3	65	250	●
102	RPK102-HRZ	15	500	99^{+5}_{-3}	65	250	●

Note:
1. RoHS & REACH Comply.

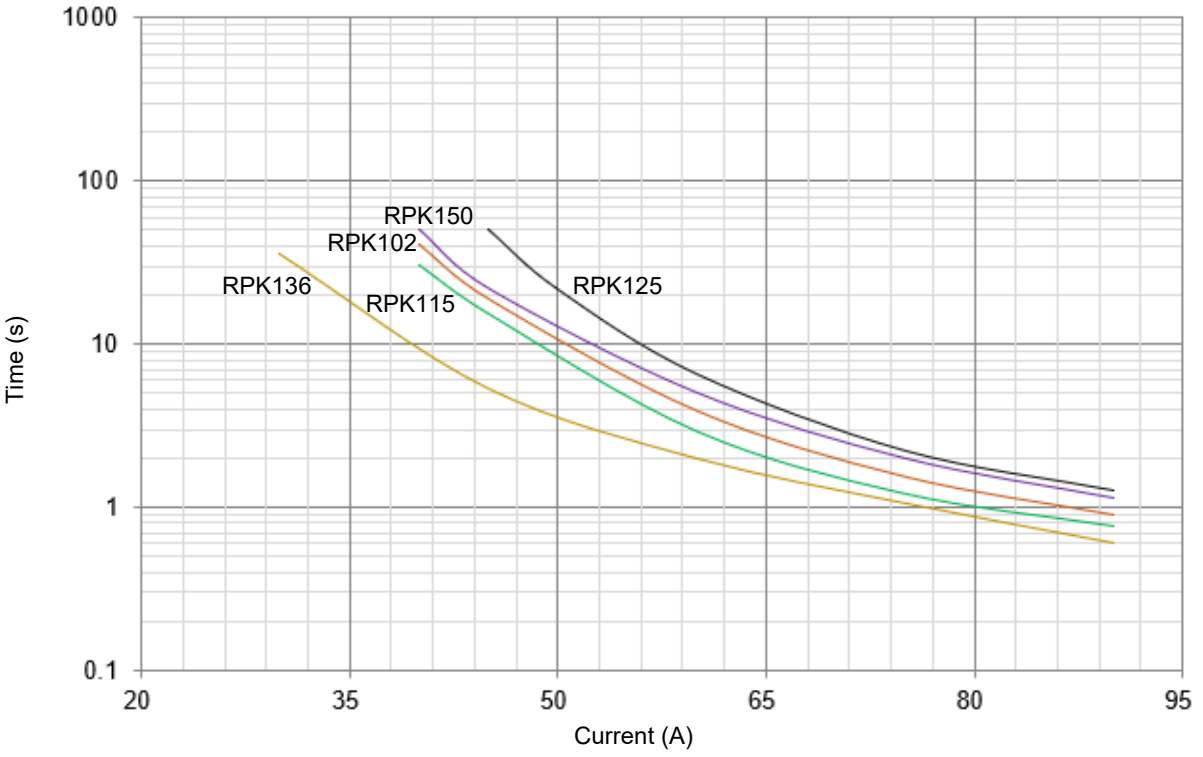
Temp.-Time Curve

The functioning temperature time curve of Alloy Thermal-Link in different Temp. oil bath (For reference only).



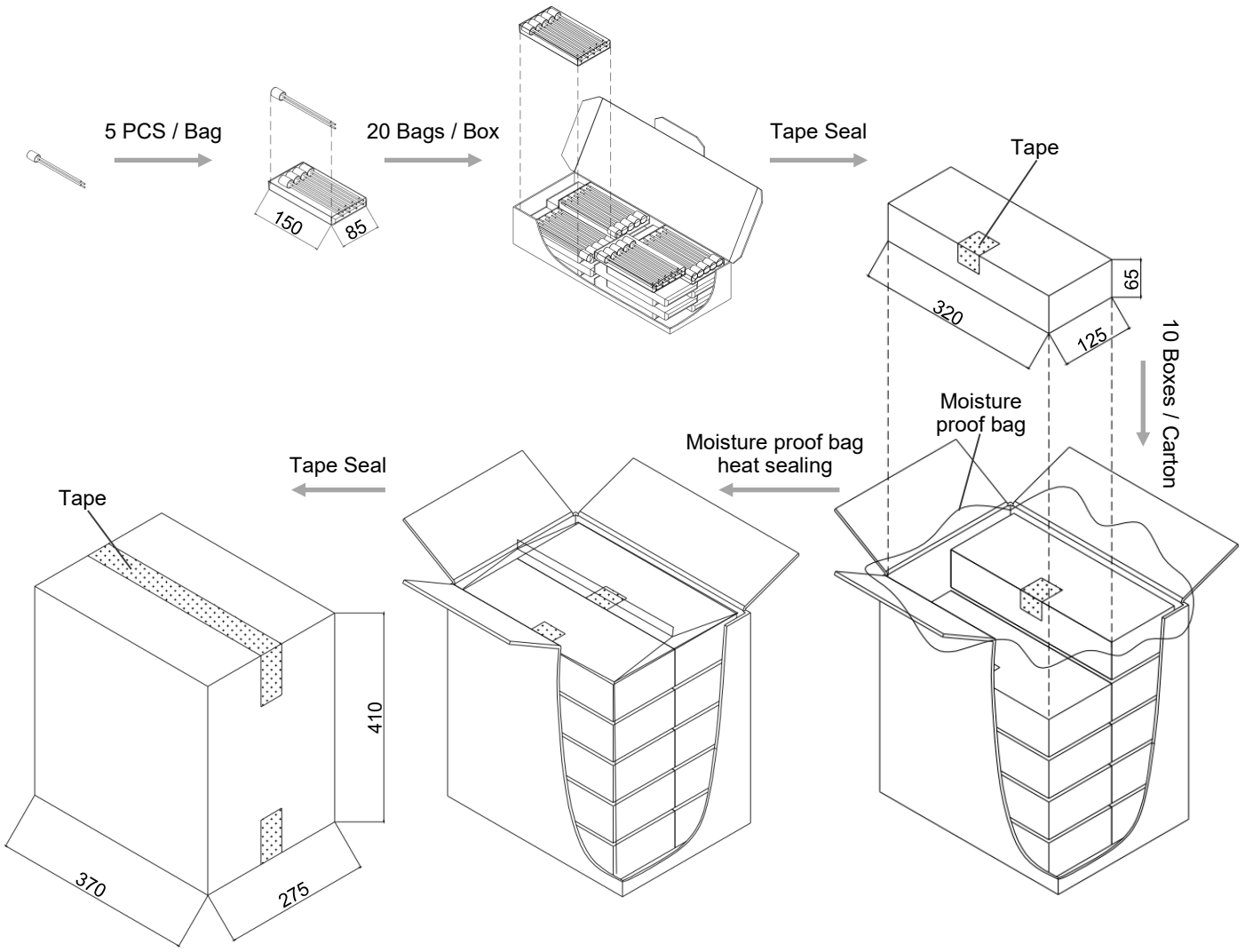
Current-Time Curve

This is an illustrated curve, describing the opening time at Multi-times rated current in the condition of the room Temp. 25 °C (For reference only).



Packaging Information

Item	PE Bag	Box	Carton
Dimensions (mm)	150 x 85	320 x 125 x 65	370 x 275 x 410
Quantity (PCS)	5	100	1000
Gross Weight (kg)			9 ± 10%



Glossary

Item	Description
DC-ATCO	**DC-Alloy Thermal-Link** DC-Alloy type Thermal-Link, Alloy is thermal element.
T_f	**Rated Functioning Temp.** The temperature of the Thermal-Link which causes it to change the state of conductivity with a detection current up to 10 mA as the only load. Tolerance: T_f (0 / -10) °C (GB 9816, EN 60691, K60691). Tolerance: T_f ± 7 °C (J60691).
Fusing Temp.	**Fusing Temp.** The temperature of the Alloy Thermal-Link which causes it to change its state of conductivity is measured with silicone oil bath in which the temperature is increased at the rate of 0.5 °C to 1 °C / minute, with a detection current up to 10 mA as the only load.
T_h	**Holding Temp.** The Maximum temperature at which a Thermal-Link will not change its state of conductivity when conducting rated current for 168 hours.
T_m	**Maximum Temp. Limit** The temperature of the Thermal-Link stated by the manufacturer, up to which the mechanical and electrical properties of the Thermal-Link having changed its state of conductivity, will not be impaired for a given time.
I_{min}	**Minimum Breaking Current** The minimum current that Fuse requires after the Alloy of Thermal-Link opens in the circuit.
I_r	**Rated Current** The current used to classify a Thermal-Link, which is the maximum current that Thermal-Link allows to carry and is able to cut off the circuit safely.
U_r	**Rated Voltage** The voltage used to classify a Thermal-Link, which is the maximum voltage that Thermal-link allows to carry and is able to cut off the circuit safely.

ATTENTION

Usage

1. When atmosphere pressure is from 80 kPa to 106 kPa, the related altitude shall be from –500 m to 2000 m.
2. Operating voltage less than rated voltage of DC-ATCO, operating current less than rated current of DC-ATCO.
3. Do not touch the DC-ATCO body or lead wires directly when power is on, to avoid burn or electric shock.

Replacement

DC-ATCO is a non-repairable product. For safety sake, it shall be replaced by an equivalent DC-ATCO from the same manufacturer, and mounted in the same way.

Storage

Do not store the DC-ATCO at the high temp., high humidity or corrosive gas environment. The product shall be stored at 25 ± 5 °C and ≤ 70% RH, avoid direct sunlight and shall use them up within 1 year after receiving the goods.

Installation

Make Sure the Temp. of Installation Position

1. It is recommended that a dummy DC-ATCO with inbuilt thermo-couple shall be used to determine the proper temp.
2. he terminal product should be tested to ensure that potential abnormal conditions do not cause ambient temp. to exceed the T_m of the DC-ATCO.
3. Mount the DC-ATCO at the location where temp. rises evenly.

Installation position of mechanical performance requirements

1. Ensure that the lead wire is long enough, and avoid actions such as press, tensile or twist.
2. The seal or body of DC-ATCO must not be damaged, burned or over heated.

Mechanical Connection

Riveting

1. Choose small resistivity riveting material and be riveted.
2. A flexible lead or lead with low resistance should be used to rivet the DC-ATCO.
3. Contact resistance should be minimal, Large contact resistance will lead to higher temp., DC-ATCO Functioning in advance.

Soldering

Hand-Soldering

1. Soldering should be carried out according to Table T-1.
2. The thermal element of DC-ATCO is thermal element with low melting point, which is jointed with DC-ATCO lead wires. Improper soldering operation (too high soldering temp. , too long soldering time, too short lead wire etc.) may transfer more heat to the thermal element and DC-ATCO may open in advance.
3. When soldering conditions are more severe than those listed in Table T-1, a heat sink fixture should be used between soldering point and DC-ATCO body.
4. When soldering, please do not pull / push or twist DC-ATCO body or lead wires.
5. After soldering, let it naturally cool for longer than 20 seconds. During cooling, never move the DC-ATCO body or lead wires.

TABLE T-1 Hand-Soldering Time

Rated Functioning Temp. (T_f)	Max. Allowable Soldering Time for Different Lead Wire Length (Fig.H-1)						Max. Soldering Temp.
	Length	Time Tinned Copper Wire	Length	Time Tinned Copper Wire	Length	Time Tinned Copper Wire	
(°C)	(mm)	(s)	(mm)	(s)	(mm)	(s)	(°C)
76 ~ 101	10	1[a]	20	2	30	3	400
102 ~ 115	10	1[a]	20	2	30	3	
116 ~ 135	10	1[a]	20	3	30	5	
136 ~ 150	10	3	20	5	30	5	
151 ~ 230	10	4	20	6	30	7	

a: Auxiliary heat sink fixture is required to avoid DC-ATCO cutting off unexpectedly.

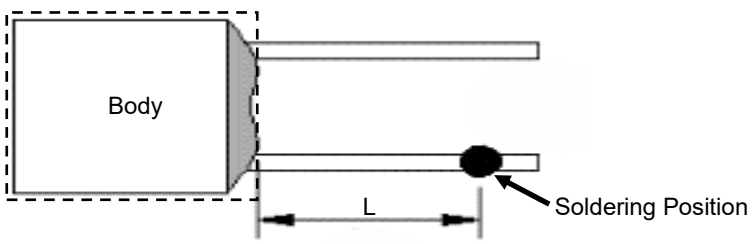


FIGURE T-1

Lead Wire Forming

1. If lead wire has to be bent, please pay attention to the distance between body and bending point. Refer to Table T-3.
2. When bending leads, please use pincher or similar tools to fix the product as shown in Figure T-2 to avoid damaging the product.
3. During forming and mounting, lead wire should not be cut, nicked, bent sharply, to avoid breaking the product.
4. Tangential forces on the leads must be avoided (i.e. pushing or pulling on the leads at angle to DC-ATCO body) as such forces may damage the seal of DC-ATCO.
5. Bending radius R: ≥ 15 d, as shown in Figure T-2.

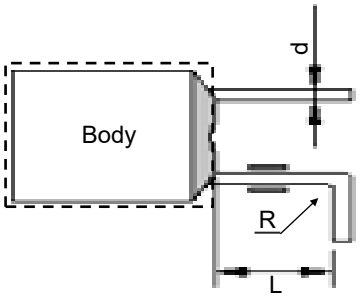
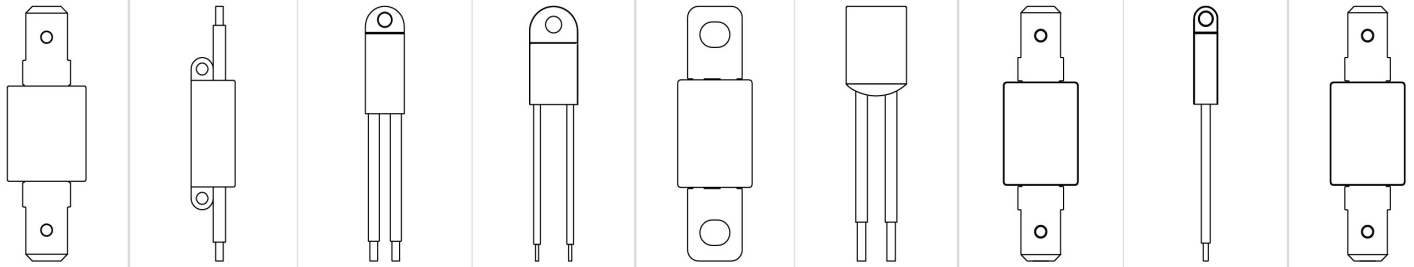


FIGURE T-2

TABLE T-3 Distance between Body and Bending Point

Lead Wire	d	(mm)	< 1.0	1.0 to 1.2	> 1.2
	L	(mm)	≥ 3	≥ 5	≥ 10

Direct Current Thermal-Link Alloy Type (DC-ATCO) Features & Model List Overview

Rated Functioning Temp. (T_f) °C	Model								
230	○	○	○	○	○	○	○	○	○
221	○	○	○	○	○	○	○	○	○
205	○	○	○	○	○	○	○	○	○
200	○	○	○	○	○	○	○	○	○
187	TGH187-HVS^	ASL187A-LSF^	RSK187A-KSS^	RVH187-HSF^	ARL187-LRA^	○	○	RQF187-FQS^	○
160	○	○	○	○	○	○	○	○	○
150	TGH150-HVS^	ASL150A-LSF^	RSK150A-KSS^	RVH150-HSF^	ARL150-LRA^	RPK150-HRZ^	TG150C-HQZ^	RQF150-FQS^	TG150C-JPZ^
145	○	○	○	○	○	○	○	○	○
139	○	○	○	○	○	○	○	○	○
136	TGH136-HVS^	ASL136A-LSF^	RSK136A-KSS^	RVH136-HSF^	ARL136-LRA^	RPK136-HRZ^	TG136C-HQZ^	RQF136-FQS^	TG136C-JPZ^
135	○	○	○	○	○	○	○	○	○
133	○	○	○	○	○	○	○	○	○
130	TGH130-HVS^			RVH130-HSF^	○	○	○	RQF130-FQS^	○
125	TGH125-HVS^	ASL125A-LSF^	RSK125A-KSS^	RVH125-HSF^	ARL125-LRA^	RPK125-HRZ^	TG125C-HQZ^	RQF125-FQS^	TG125C-JPZ^
123	○	○	○	○	○	○	○	○	○
120	○	○	○	○	○	○	○	○	○
115	TGH115-HVS^	ASL115A-LSF^	RSK115A-KSS^	RVH115-HSF^	ARL115-LRA^	RPK115-HRZ^	TG115C-HQZ^	RQF115-FQS^	TG115C-JPZ^
105	○	○	○	○	○	○	○	○	○
102	TGH102-HVS^	ASL102A-LSF^	RSK102A-KSS^	RVH102-HSF^	ARL102-LRA^	RPK102-HRZ^	TG102C-HQZ^	RQF102-FQS^	TG102C-JPZ^
97	○	○	○	○	○	○	○	○	○
93	○	○	○	○	○	○	○	○	○
86	○	○	○	○	ARL86-LRA^	○	TG86C-HQZ^	RQF86-FQS^	○
76	○	○	○	○	○	○	○	○	○
I_r (A) Rated Current	15	30	25	15	30	15	15	10	20
U_r (VDC)^ Rated Voltage	850	600			500		450		400
U_r (VAC)* Rated Voltage	○	○			○		○		○
Product Structure									
	Axial Shape		Radial Shape		Axial Shape	Radial Shape	Axial Shape	Radial Shape	Axial Shape

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Direct Current Thermal-Link Alloy Type (DC-ATCO) Features & Model List Overview

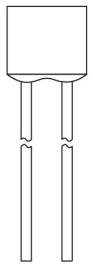
Rated Functioning Temp. (T_r) °C	Model											
230	○	○	○	○	○	○	○	○	○	○	○	○
221	○	○	○	○	○	○	○	○	○	○	○	○
205	○	○	○	○	○	○	○	○	○	○	○	○
200	○	○	○	○	○	○	○	○	○	○	○	○
187	○	○	○	○	○	○	○	○	○	○	○	○
160	○	○	○	○	○	○	○	○	○	○	○	○
150	TG150C-JSZ*	○	○	○	HN150^*	HP150^*	HS150^*	○	QD150^	PD150^	TD150^	SD150^
145	○	○	○	○	○	○	○	○	○	○	○	○
139	○	○	○	○	○	○	○	○	○	○	○	○
136	TG136C-JSZ*	○	○	○	HN136^*	HP136^*	HS136^*	○	QD136^	PD136^	TD136^	SD136^
135	○	○	○	○	○	○	○	○	○	○	○	○
133	○	○	○	○	○	○	○	○	○	○	○	○
130	○	○	○	○	○	○	○	○	QD130^	PD130^	TD130^	SD130^
125	TG125C-JSZ*	○	○	○	HN125^*	HP125^*	HS125^*	ALP125-PLZ^	QD125^	PD125^	TD125^	SD125^
123	○	○	○	○	○	○	○	○	○	○	○	○
120	○	○	○	○	○	○	○	○	○	○	○	○
115	TG115C-JSZ*	○	○	ALP115-HLZ^	○	○	○	○	QD115^	PD115^	TD115^	SD115^
105	○	○	○	○	○	○	○	○	○	○	○	○
102	TG102C-JSZ*	○	○	○	○	○	○	ALP102-PLZ^	QD102^	PD102^	TD102^	SD102^
97	○	○	○	○	○	○	○	○	○	○	○	○
93	○	○	○	○	○	○	○	○	○	○	○	○
86	○	TG86C-HSZ*	RPF86-FPF^	○	○	○	○	○	○	○	○	○
76	○	○	○	○	○	○	○	○	○	○	○	○
I_r (A) Rated Current	20	15	10	15	15	10	5	60	20	15 16	10	25
U_r (VDC)^ Rated Voltage	○		400	200				180	125			
U_r (VAC)* Rated Voltage	600		○	○	690	500		○	○			
Product Structure	Axial Shape		Radial Shape		Axial Shape				Radial Shape			

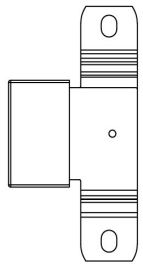
Direct Current Thermal-Link Alloy Type (DC-ATCO) Features & Model List Overview

Rated Functioning Temp. (T_r) °C	25	20	200	100	10	15 16	50
	I_r (A) Rated Current						
	U_r (VDC)^ Rated Voltage	120	100 ○	100 ○	100		60
	U_r (VAC)* Rated Voltage	400 300 250	400 300 250 ○	125 ○	125 ○	○	○
230	○ ○ ○	○ ○ ○	○ ○	○ ○	○ ○	○ ○	ADN230B-NEZ
221	○ ○ ○	○ ○ ○	○ ○	○ ○	○ ○	○ ○	○
205	○ ○ ○	○ ○ ○	○ ○	○ ○	○ ○	○ ○	○
200	○ ○ ○	○ ○ ○	○ ○	○ ○	○ ○	○ ○	○
187	○ ○ ○	○ ○ ○	○ ○	○ ○	○ ○	○ ○	○
160	○ ○ ○	○ ○ ○	○ ○	○ ○	○ ○	○ ○	○
150	○ ○ ○	○ ○ ○	○ ○	○ ○	S150^	T150^	○
145	○ ○ ○	○ ○ ○	○ ○	○ ○	○ ○	○ ○	○
139	○ ○ ○	○ ○ ○	○ ○	○ ○	○ ○	○ ○	○
136	Q136^* Q136* Q136*	P136^* P136* P136*	TB136-UHZ^ TB136-UJZ*	TS136-RHZ^ TS136-RJZ*	S136^	T136^	○
135	○ ○ ○	○ ○ ○	○ ○	○ ○	○ ○	○ ○	○
133	○ ○ ○	○ ○ ○	○ ○	○ ○	○ ○	○ ○	○
130	○ ○ ○	○ ○ ○	TB130-UHZ^ TB130-UJZ*	○ ○	○ ○	○ ○	○
125	Q125^* ○ ○	P125^* ○ ○	TB125-UHZ^ TB125-UJZ*	TS125-RHZ^ TS125-RJZ*	○ ○	○ ○	○
123	○ ○ ○	○ ○ ○	○ ○	○ ○	○ ○	○ ○	○
120	○ ○ ○	○ ○ ○	○ ○	○ ○	○ ○	○ ○	○
115	Q115^* Q115* Q115*	P115^* P115* P115*	TB115-UHZ^ TB115-UJZ*	TS115-RHZ^ TS115-RJZ*	S115^	T115^	○
105	○ ○ ○	○ ○ ○	○ ○	○ ○	○ ○	○ ○	○
102	Q102^* ○ ○	P102^* P102* P102*	TB102-UHZ^ TB102-UJZ*	TS102-RHZ^ TS102-RJZ*	S102^	T102^	○
97	○ ○ ○	○ ○ ○	○ ○	○ ○	○ ○	○ ○	○
93	○ ○ ○	○ ○ ○	○ ○	○ ○	○ ○	○ ○	○
86	○ ○ ○	○ ○ ○	○ ○	○ ○	○ ○	○ ○	○
76	○ ○ ○	○ ○ ○	○ ○	○ ○	○ ○	○ ○	○

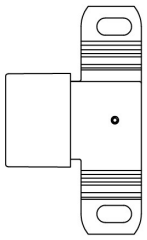
Model

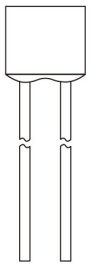
Product Structure

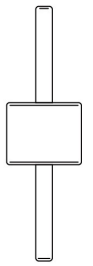




Radial Shape







Axial Shape

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Direct Current Thermal-Link Alloy Type (DC-ATCO) Features & Model List Overview

Rated Functioning Temp. (T_r) °C	Model																						
230	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
221	R31^*	○	U31^*	○	○	○	○	○	C31^*	○	○	○	○	B31^*	○	H31^*	V31^*	V31*	○	○	X31*	K31*	○
205	R32^*	○	U32^*	○	○	○	○	○	C32^*	○	○	○	○	B32^*	○	H32^*	V32^*	V32*	○	○	X32*	K32*	○
200	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
187	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	X17^*	K17^*	○
160	R16^*	○	U16^*	○	○	○	○	○	C16^*	○	○	○	○	○	○	H16^*	V16^*	○	○	○	X16^*	K16^*	F16*
150	R7^*	○	U7^*	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	X7*	K7*	F7*
145	R6^*	○	U6^*	C6^	○	○	○	○	○	○	○	X6^	○	○	○	○	○	○	K6^	F6^	X6*	K6*	F6*
139	○	CR13^	○	○	M13^	C13^	○	○	○	SF13^	V13^	○	○	○	○	○	○	○	○	F13^	○	○	F13*
136	○	○	○	○	○	○	○	○	○	○	○	X9^	○	○	○	○	○	○	K9^	○	X9*	K9*	○
135	R5^*	○	U5^*	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	X5*	K5*	○
133	○	○	○	○	○	○	○	○	○	○	V8^	○	SF8^	○	○	○	○	○	○	F8^	X8*	K8*	F8*
130	R4^*	○	U4^*	○	○	○	○	○	○	○	V4^	○	SF4^	○	○	○	○	○	○	F4^	X4*	K4*	F4*
125	R3^*	○	U3^*	○	○	○	○	○	○	○	○	○	○	○	○	H3^*	○	○	○	○	X3^*	K3^*	F3*
123	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
120	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
115	R2^*	○	U2^*	○	○	○	C2^	○	○	○	V2^	○	SF2^	○	○	○	○	○	○	F2^	X2^*	K2^*	F2*
105	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
102	R1^*	○	U1^*	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	F1^	X1^*	K1^*	F1*
97	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
93	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
86	R18^*	○	U18^*	○	○	○	○	C18^	○	○	○	○	○	○	V18^	○	○	○	○	F18^	X18^*	K18^*	F18*
76	R0^*	○	U0^*	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	X0*	K0*	F0*
I_r (A) Rated Current	15		10		9	8.5	8	6	5		4		3		2.5	2		1	4	3		2	1
U_r (VDC)^ Rated Voltage	60																						
U_r (VAC)* Rated Voltage	250	○	250			○			250	○			250	○		250		125	○			250	
Product Structure	Axial Shape																		Radial Shape				

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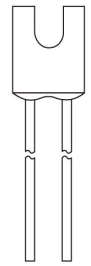
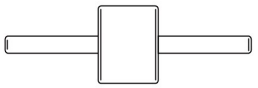
Rated Functioning Temp. (T_r) °C	Model														
230	○	○	○	○	○	○	○	○	○	○	○	ADN230B-NDZ^	ADN230B-PDZ^	○	ADN230B-QBZ^
221	XG31*	KG31*	○	○	C31*	○	B31*	○	H31*	○	○	○	○	ADN205B-NDZ^	○
205	XG32*	KG32*	○	○	C33*	○	B32*	○	H32*	○	○	○	○	○	○
200	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
187	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
160	XG16*	KG16*	○	○	○	B16*	○	○	○	○	○	○	○	○	○
150	XG7*	KG7*	C7^	C7*	○	B7^*	○	H7^*	○	V7^*	○	○	○	○	○
145	XG6*	KG6*	C6^	C6*	○	B6^*	○	H6^*	○	V6^*	○	○	○	○	○
139	○	○	C13^	C13*	○	B13^*	○	H13^*	○	V13^*	○	○	○	○	○
136	XG9*	KG9*	C9^	C9*	○	B9^*	○	H9^*	○	V9^*	○	○	○	○	○
135	XG5*	KG5*	C5^	C5*	○	B5^*	○	H5^*	○	V5^*	○	○	○	○	○
133	XG8*	KG8*	C8^	C8*	○	B8^*	○	H8^*	○	V8^*	○	○	○	○	○
130	XG4*	KG4*	C4^	C4*	○	B4^*	○	H4^*	○	V4^*	○	○	○	○	○
125	XG3^*	KG3^*	C3^	C3*	○	B3^*	○	○	○	V3^*	○	○	○	○	○
123	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
120	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
115	XG2^*	KG2^*	C2^	C2*	○	B2^*	○	H2^*	○	V2^*	○	○	○	○	○
105	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
102	XG1^*	KG1^*	○	C1^*	C1*	B1^*	B1*	H1^*	H1*	V1^*	V1*	○	○	○	○
97	○	○	○	○	C21^*	○	B21^*	○	H21^*	○	V21^*	○	○	○	○
93	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
86	XG18^*	KG18^*	○	C18^*	C18*	B18^*	B18*	H18^*	H18*	V18^*	V18*	○	○	○	○
76	XG0*	KG0*	○	C0*	○	B0^*	B0*	H0^*	H0*	V0^*	V0*	○	○	○	○
I_r (A) Rated Current	3	2	7	5		3		2		1		50	55	50	80
U_r (VDC)^ Rated Voltage	60		50									49	48		24
U_r (VAC)* Rated Voltage	250		○	250	125	250	125	250	125	250	125	○			
Product Structure															
	Radial Shape											Axial Shape			

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