DC-ATCO
## Direct Current Thermal-Link (Alloy Type)

RVH 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 case, filler material, a fuse, flux resin, the low melting point alloys (thermal element), 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.
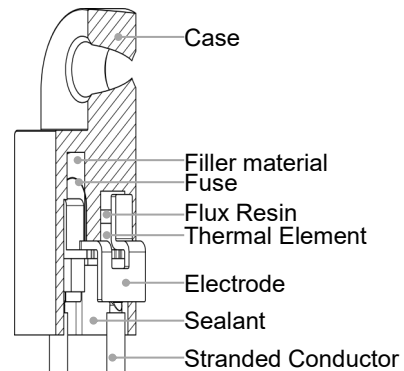
The SETsafe | SETfuse Direct Current Thermal-Link (Alloy Type) is available in axial and radial shapes, with a rated functioning temperature ranging from 102 °C to 187 °C, rated current 15 A, rated voltage 600 VDC. It is compliant with RoHS and REACH regulations.
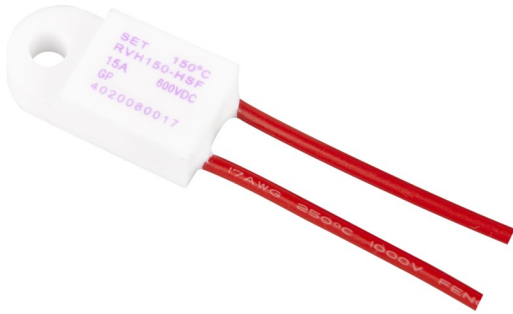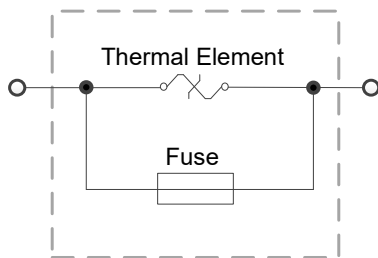
Marking
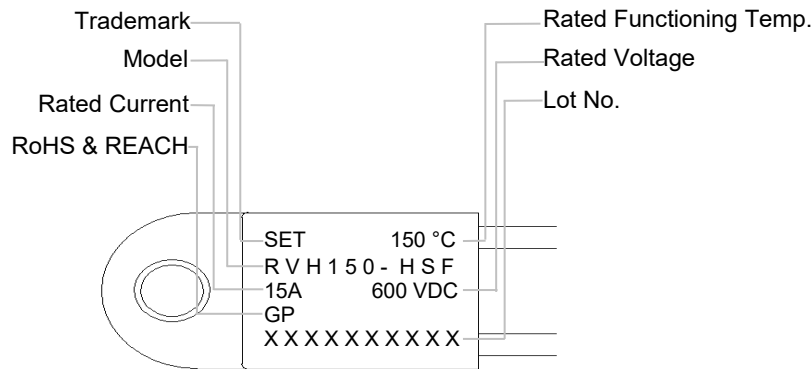
Product Schematic

Structure Diagram

Features

- 0 to 600 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
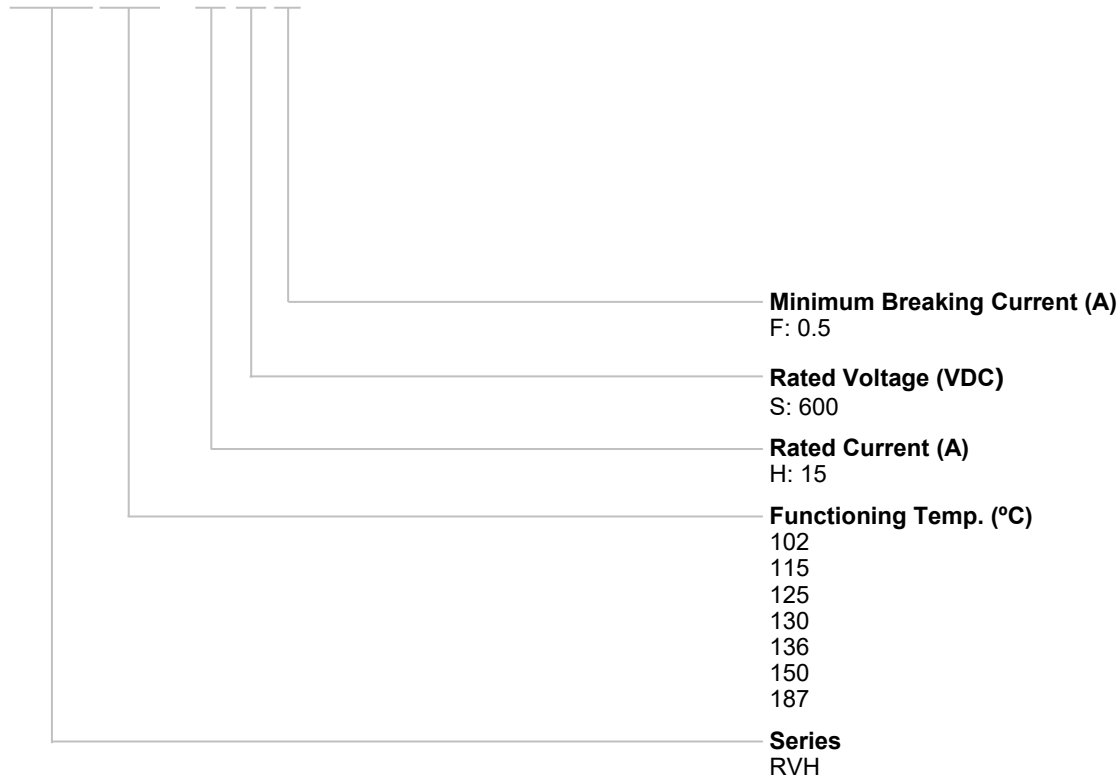
- Rated Functioning Temp.
- Stranded Conductor Size

Part Number System

RVH150 - H S F

Minimum Breaking Current (A)
F: 0.5

Rated Voltage (VDC)
S: 600

Rated Current (A)
H: 15

Functioning Temp. (ºC)
102
115
125
130
136
150
187

Series
RVH

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.

DC-ATCO
Direct Current Thermal-Link (Alloy Type)

Dimensions (Unit: mm)
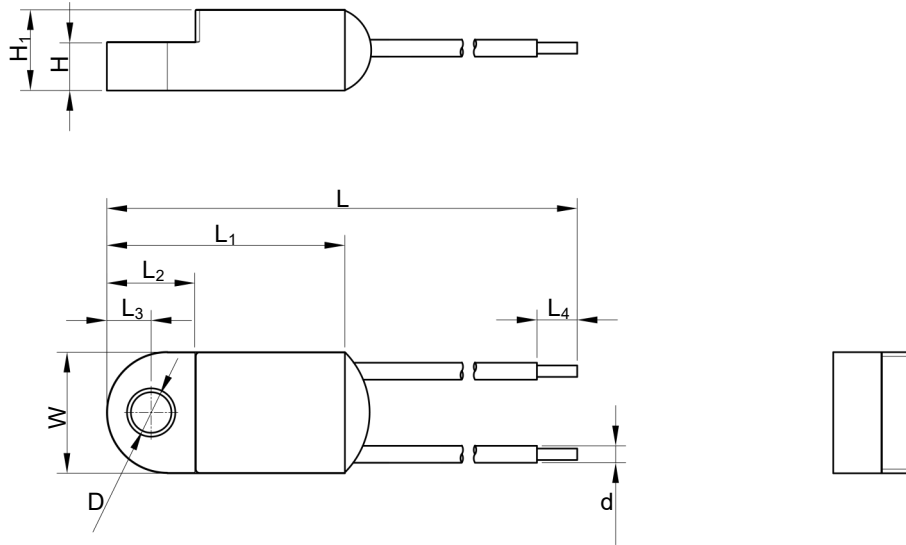
L	L$_1$	L$_2$	L$_3$	L$_4$	W	H	H$_1$	D	d
129.5 ± 5.0	29.5 ± 1.0	11.0 ± 0.5	5.5 ± 0.5	10.0 ± 1.0	15.0 ± 1.0	6.0 ± 0.5	10.0 ± 1.0	5.0 ± 0.5	AWG17

Specifications

| Rated Functioning Temp. (T_f) °C	Model	I_r	U_r	Rated Functioning Temp.	T_h	T_m	I_{min}	RoHS REACH
		(A)	DC (V)	(°C)	(°C)	(°C)	(A)	
187	RVH187-HSF	15	600	182 $^{+5}_{-3}$	160	250	0.5	●
150	RVH150-HSF	15	600	146 ± 3	100	250	0.5	●
136	RVH136-HSF	15	600	131 ± 3	75	250	0.5	●
130	RVH130-HSF	15	600	126 ± 3	60	250	0.5	●
125	RVH125-HSF	15	600	122 ± 3	65	250	0.5	●
115	RVH115-HSF	15	600	112 ± 3	72	250	0.5	●
102	RVH102-HSF	15	600	99 $^{+5}_{-3}$	65	250	0.5	●

Note:
1. RoHS & REACH Comply.

Temp.-Time Curve

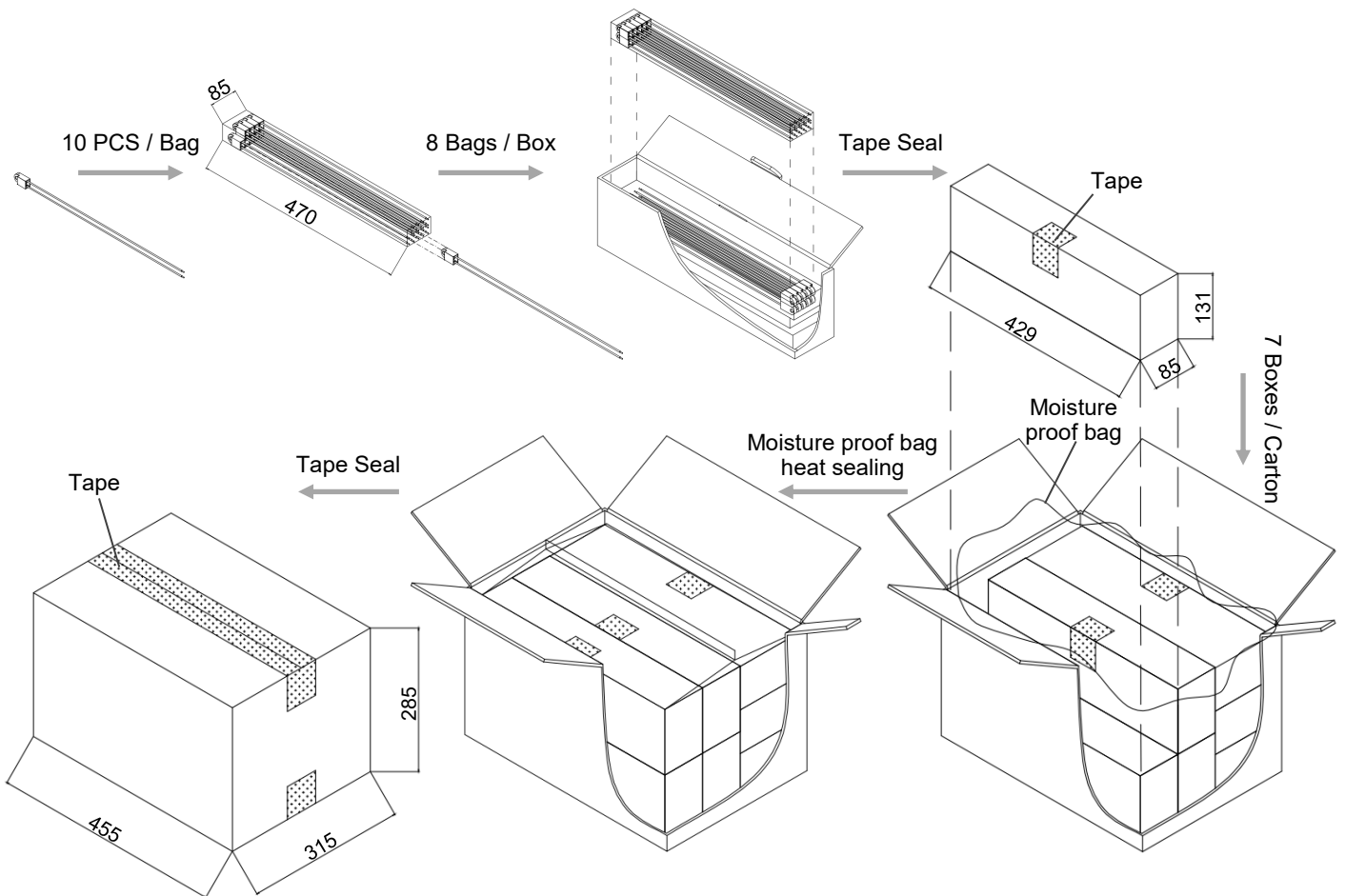The functioning temperature time curve of Alloy Thermal-Link in different Temp. oil bath (For reference only).
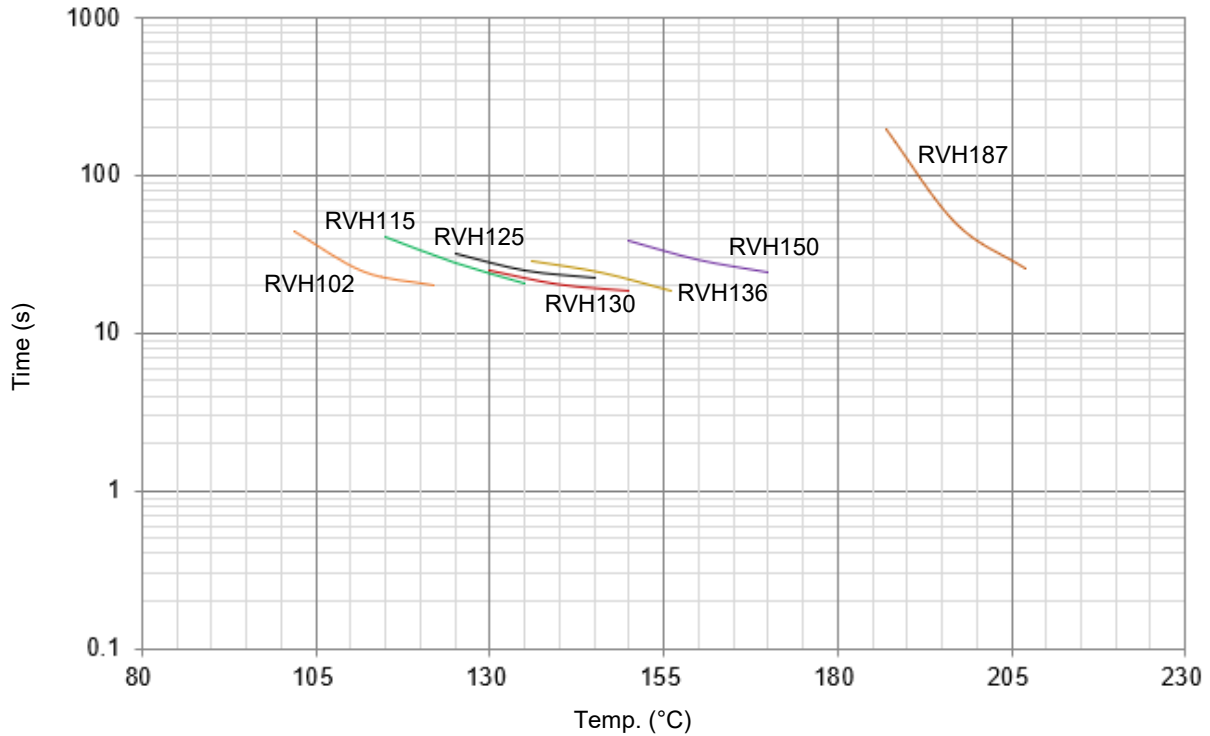
Current-Time Curve

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).
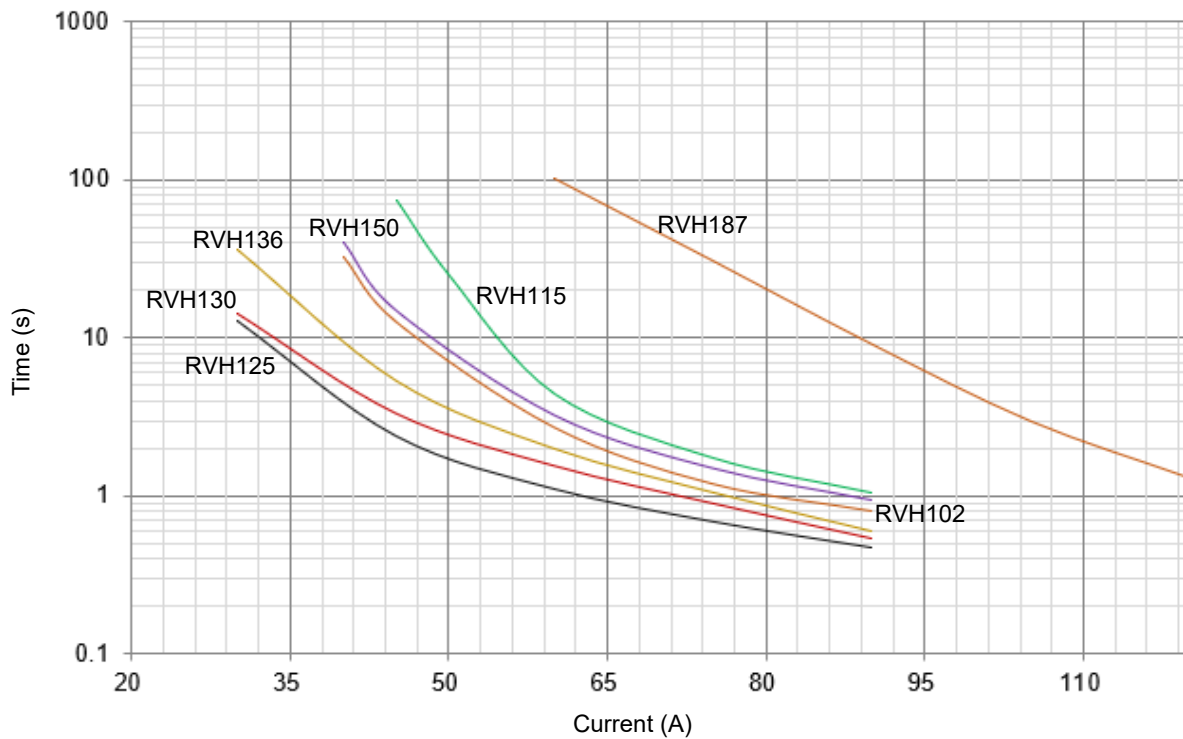
Packaging Information

Item	PE Bag	Box	Carton
Dimensions (mm)	470 x 85	429 x 85 x 131	455 x 315 x 285
Quantity (PCS)	10	80	560
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	Length	Time	Length	Time	
		Tinned Copper Wire		Tinned Copper Wire		Tinned Copper Wire	
(°C)	(mm)	(s)	(mm)	(s)	(mm)	(s)	(°C)
76 ~ 101	10	1[a]	20	2	30	3	
102 ~ 115	10	1[a]	20	2	30	3	
116 ~ 135	10	1[a]	20	3	30	5	400
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.
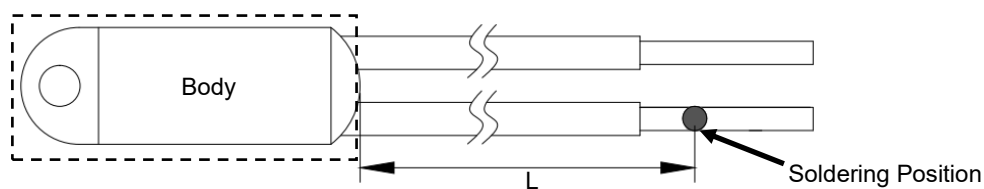
FIGURE T-1

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.
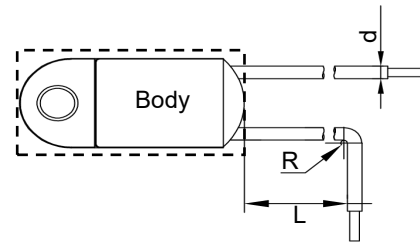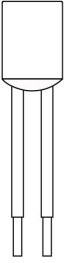
FIGURE T-2
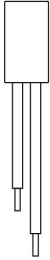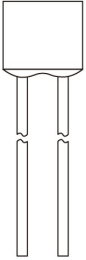
TABLE T-3 Distance between Body and Bending Point

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

T_f °C									
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	○	○	○	○	○	○	○	○	○

Model

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

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

Rated Functioning Temp. (T_r) °C — Model

T_r (°C)	Col1	Col2	Col3	Col4	Col5	Col6	Col7	Col8	Col9	Col10	Col11	Col12
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

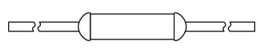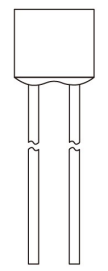Axial Shape — Radial Shape — Axial Shape — Radial Shape

SETsafe | SETfuse
RVH Series

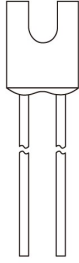# Direct Current Thermal-Link Alloy Type (DC-ATCO) Features & Model List Overview

Rated Functioning Temp. (T_r) °C

T_r °C	25A col1	25A col2	25A col3	20A col4	20A col5	20A col6	200A col7	200A col8	100A col9	100A col10	10A col11	15/16A col12	50A col13
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

	col1-3	col4-6	col7-8	col9-10	col11	col12	col13
I_r (A) Rated Current	25	20	200	100	10	15 / 16	50
U_r (VDC)^ Rated Voltage	120	120	100	100	100	100	60
U_r (VAC)* Rated Voltage	400 / 300 / 250	400 / 300 / 250	125	125			

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**

T_r (°C)	15	10	9	8.5	8	6	5	4	3	2.5	2	1	4	3	2	1
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^			V13^	SF13^					F13^			F13*
136											X9^	K9^			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*

	15	10	9	8.5	8	6	5	4	3	2.5	2	1	4	3	2	1
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

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

Rated Functioning Temp. (T_f) °C — **Model**

T_f (°C)	XG	KG	C (7A)	C (5A,250V)	C (5A,125V)	B (3A,250V)	B (3A,125V)	H (2A,250V)	H (2A,125V)	V (1A,250V)	V (1A,125V)	ADN230B-NDZ^	ADN230B-PDZ^	ADN205B-NDZ^	ADN230B-QBZ^
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

SETsafe | SETfuse

RVH Series