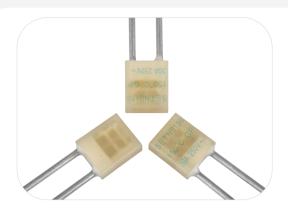


NB Series



Description

Thermal-Link (ATCO)-Alloy Type is defined as a non-resettable protective device functioning one time only. It is widely used in electrical equipment. ATCO is mainly consist of fusible alloy, flux resin, case, sealant and lead wires. Normally, fusible alloy is jointed to the two lead wires. Under abnormal conditions, when the temp. reaches to the fusing temp. of ATCO, the fusible alloy melts and quickly retracts to the two lead wire ends with the aid of the flux resin and disconnects the circuit completely.

SETsafe | SETfuse Thermal-Link (ATCO)-Alloy Type NB series Rated Functioning Temp. from 115 °C to 150 °C, Rated Current: 30 A, safety certification Includes TUV, PSE, CCC, and complies with RoHS and REACH.

Features

- Non-Resettable
- High Accuracy of Functioning Temp.
- High Surge Capacity
- **RoHS & REACH Compliant**

Applications

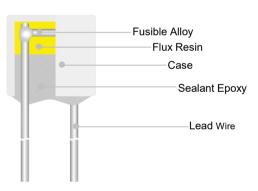
- Surge Protective Devices
- Power Strips
- Lamps
- Switched-Mode Power Supplies
- Home Electrical Appliances
- **Batteries**

Customization

- Other Temp.
- The Length of Lead Wires
- Leads Forming Types

Structure Diagrams

Radial

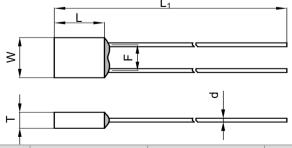


Marking

Radial (Color for reference only)



Dimensions (mm)



L	L ₁	W	Т	d	F
13.0 ± 1.0	50.0 ± 2.0	11.5 ± 1.0	4.9 ± 0.8	1.70 ± 0.05	7.4 ± 0.8



NB Series

(W)

CCC

PSE

RoHS REACH

Specifications

Temp. (T _f) °C		Model	Fusing Temp.	T _h	T _m	I _r	U r	<i>I</i> _n 8 / 20 μs (15 Times)	Ι _{max} 8 / 20 μs (1 Time)	A
Ter			(°C)	(°C)	(°C)	(A)	(V)	(kA)	(kA)	TUV
Functioning	150	NB150	146 ± 2	116	160	30	AC 250	20	40	•
	136	NB136	132 ± 2	102	160	30	AC 250	20	40	•
Rated	115	NB115	112 ± 2	78	160	30	AC 250	20	40	•

Note:

^{1: &}quot;●"Means certificated, "○"Means non-certificated.

^{2:} RoHS & REACH Compliant .

NB Series

Agency Information

Agency Symbol	Standards	The File No. and certification No. obtained by SETsafe SETfuse
A	EN 60691	R50447212
PS	J60691	JET2121-32001-2032、JET2121-32001-2033 JET2121-32001-2034
(W)	GB 9816.1	2020980205000175

Soldering

Hand-Soldering

- 1. Soldering should be carried out according to Table T-1.
- 2. The thermal element of ATCO is fusible alloy with low melting point, which is jointed with 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 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 ATCO body.
- 4. When soldering, please do not pull / push or twist ATCO body or lead wires.
- 5. After soldering, let it naturally cool for longer than 20 seconds. During cooling, never move the ATCO body or lead wires.

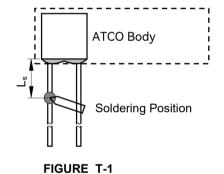


TABLE T-1 Hand-Soldering Time

Rated Functioning Temp.		Max. Allow	able Sol	dering Tir	ne for Differer	nt Lead W	/ire Lengt	h (Fig.T-1)		Max. Soldering Temp.
$(T_{\rm f})$	L _s Length	Time	•	L _s Length	Time		L _s Length	Time	е	•
	Lengin	Tinned Copper Wire	CP Wire	Lengui	Tinned Copper Wire	CP Wire	Lengin	Tinned Copper Wire	CP Wire	
(°C)	(mm)	(s)	(s)	(mm)	(s)	(s)	(mm)	(s)	(s)	(°C)
102 to 115	10	1 ^a	4	20	2	5	30	3	6	
116 to 135	10	1 ^a	4	20	3	6	30	5	8	400
136 to 150	10	3	6	20	5	8	30	5	8	

a: Auxiliary Heat Sink Fixture is Required to Avoid ATCO Cutting off Unexpectedly.



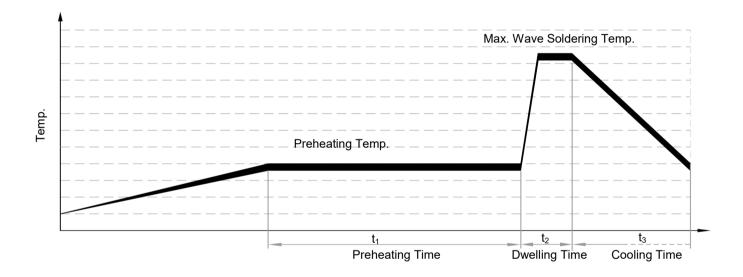
NB Series

Wave Soldering

The wave soldering parameters as Table T-2, for reference only, when ATCO is for practice use, you need to do some validation experiments. For example, using X-RAY to see the fusible alloy of ATCO whether damage after wave soldering.

TABLE T-2 Wave Soldering Parameters Setting

Rated Functioning Temp.	Who			ng Temp. e is Different	Preheating Time (t₁)	Max. Wave Soldering	Dwelling Time (t ₂)	Cooling Time (t ₃)
(T _f)	L _s Length	Preheating Temp.	L _s Length	Preheating Temp.		Temp.		
(°C)	(mm)	(°C)	(mm)	(°C)	(s)	(°C)	(s)	(s)
115 to 130				Recommend	Hand-Soldering	9		
131 to 150	20	80	30	90	< 60	≤ 260	≤ 3	≤ 10

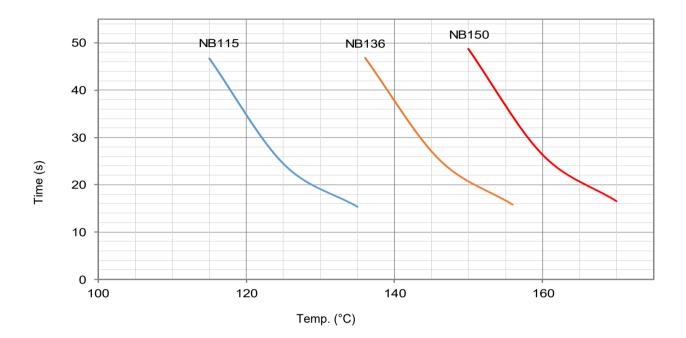




NB Series

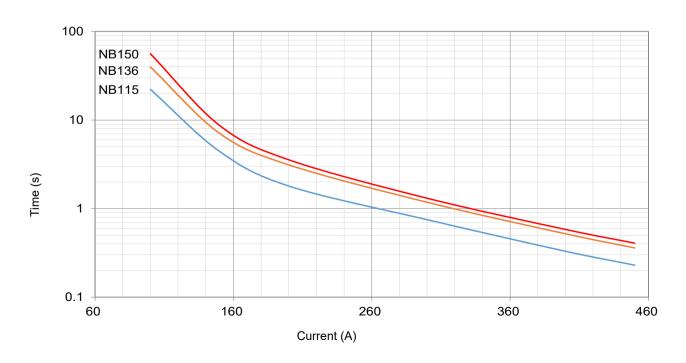
Product Temp.-Time Curve (Reference)

The Temp.-Time Curve of Thermal-Link in different temp. oil bath.



Product Current-Time Curve (Reference)

The Current-Time Curve shows functioning time at multi-times rated current at room temperature 25 ± 2 °C.



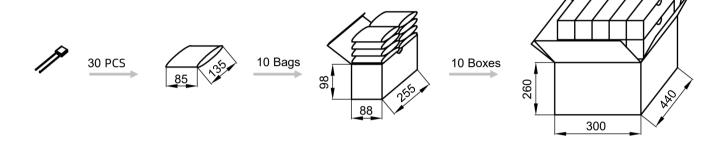


NB Series

Packaging Information

Bulk

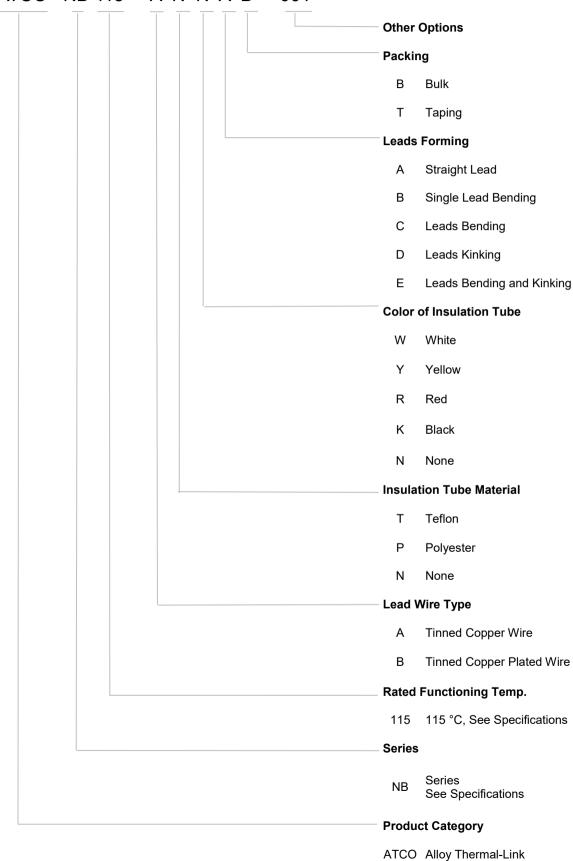
Item	PE Bag	Box	Carton
Dimensions (mm)	135 × 85	255 × 88 × 98	440 × 300 × 260
Quantity (PCS)	30	300	3000
Gross Weight (kg)			12.5 ± 10%



NB Series

Part Numbering System

ATCO -NB 115 - A N N A B - 001





NB Series

Glossary

Item	Description
тсо	Thermal-Link A non-resettable device incorporating a THERMAL ELEMENT which will open a circuit once only when exposed for a sufficient length of time to a temperature in excess of that for which it has been designed. — (GB 9816.
ATCO	Alloy Thermal-Link Alloy Type Thermal-Link, Alloy is the thermal element. — (GB 9816.
T _f	Rated Functioning Temp. The temperature of the Alloy Thermal-Link which causes it to change the state of conductivity with a detection current up to 10 mA as the only load.
11	— (GB 9816. Tolerance: $T_{\rm f}$ °C (GB 9816.1, EN 60691, K60691). Tolerance: $T_{\rm f} \pm 7$ °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. — (GB 9816.
T _h	Holding Temp. The Maximum temperature at which a Alloy Thermal-Link will not change its state of conductivity when conducting rated current for 168 hours. — (GB 9816.
T _m	Maximum Temp. Limit The temperature of the Alloy Thermal-Link stated by the manufacturer, up to which the mechanical and electrical propertie of the Alloy Thermal-Link having changed its state of conductivity, will not be impaired for a given time. — (GB 9816.
I _r	Rated Current The current used to classify a Alloy Thermal-Link, which is the Maximum current that Alloy Thermal-Link allows to carry ar is able to cut off the circuit safely. — (GB 9816.
U r	Rated Voltage The voltage used to classify a Alloy Thermal-Link, which is the Maximum voltage that Alloy Thermal-Link allows to carry are is able to cut off the circuit safely. — (GB 9816.
<i>I</i> n	Nominal Discharge Current Being able to withstand 15 peak currents of waveform 8/20 µs to test the product's durability of withstanding pulse current. — (UL 144)
I _{max}	Max. Discharge Current Being able to withstand 1 peak current of waveform 8/20 µs to test max. pulse current that the product can withstand. — (UL 144)



NB Series



Usage

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

Replace

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

Storage

Do not store the ATCO at the high temp., high humidity or corrosive gas environment, avoid influencing the solder-ability of the lead wires, the product shall be used up within 1 year after receiving the goods.

Installation

Make Sure the Temp. of Installation Position.

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

Installation position of mechanical performance requirements.

- 1. Do not locate the ATCO in a place where severe vibration always occurs.
- 2. Ensure that the lead wire is long enough, and avoid actions such as press, tensile or twist.
- 3. The seal or body of ATCO must not be damaged, burned or over heated.

NB Series

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 ATCO.
- 3. Contact resistance should be minimal, large contact resistance will lead to higher temp., ATCO Functioning in advance.

Crimping

- 1. Choose small resistivity crimping material and be crimped.
- 2. A flexible lead or lead with low resistance should be used to rivet the ATCO.
- 3. Contact resistance should be minimal, large contact resistance will lead to higher Temp., ATCO Functioning in advance.

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 Fig.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 ATCO body) as such forces may damage the seal of ATCO.

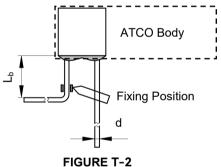


TABLE T-3 Distance between Body and Bending Point

	d	(mm)	< 1.0	1.0 - 1.2	> 1.2
Circular lead	L _b	(mm)	≥ 3	≥ 5	≥ 10

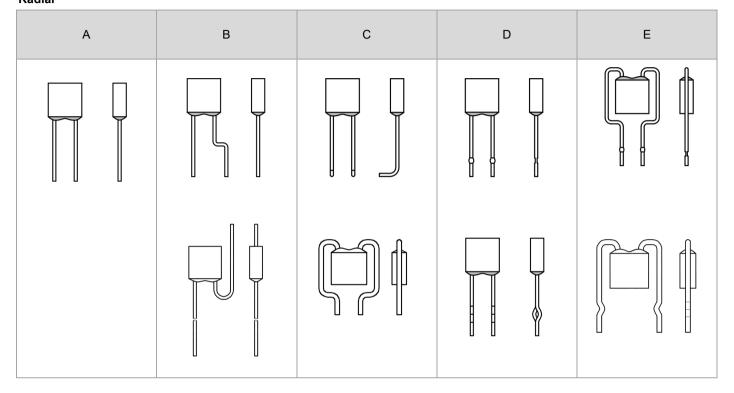


NB Series

Leads Forming Types

The below leads forming is for reference, more leads forming can be customized.

Radial



Thermal-Link (ATCO)-Alloy Type Feature & Model List Overview

	230 221 205	V31V32	O H31 H32	O B31 B32	C31	O U31 U32	O R31 R32	0 0	K31K32	X31X32	0 0	0 0	0 0	0 0	0 0	0 0	0 0	KG31KG32	O XG31 XG32	SK221	SKL230	SE230	TK221	
	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	SKL200	SE200	0	
	187	0	0	0	0	0	0	0	K17	X17	Y17	0	0	0	0	0	0	0	0	0	0	0	0	
ပွ	160	V16	H16	B16	C16	U16	R16	F16	K16	X16	Y16	0	0	0	0	0	0	KG16	XG16	SK160	0	0	TK160	
	150	V7	H7	B7	C7	U7	R7	F7	K7	X7	Y7	S150	T150	0	0	N150	G150	KG7	XG7	SK150	0	SE150	TK150	
L	145	V6	Н6	В6	C6	U6	R6	F6	K6	X6	Y6	0	0	0	0	0	0	KG6	XG6	SK145	0	SE145	TK145	
<u>o</u>	139	V13	H13	B13	C13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
er	136	V9	H9	В9	C9	0	0		K9	Х9	Y9	S136	T136	P136	Q136	N136	G136	KG9	XG9	0	0	0	0	
Rated Functioning Temp. (T,) °C	135	V5	H5	B5	C5	U5	R5	0	K5	X5	0	0	0	0	0	0	0	KG5	XG5	SK135	0	SE135	TK135	3
i.	133	V8	Н8	В8	C8	0	0	F8	K8	X8	Y8	0	0	0	0	0	0	KG8	XG8	0	0	0	0	Model
on	130	V4	H4	В4	C4	U4	R4	F4	K4	X4	Y4	0	0	0	0	N130	G130	KG4	XG4	SK130	0	0	TK130	<u> </u>
i ,	125	V3	НЗ	В3	С3	U3	R3	F3	K3	Х3	Y3	S125	T125	0	0	N125	G125	KG3	XG3	SK125	0	SE125	TK125	
Š	123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
正	120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
eq	115	V2	H2	B2	C2	U2	R2	F2	K2	X2	Y2	S115	T115	P115	Q115	N115	G115	KG2	XG2	SK115	0	SE115	TK115	
Rat	105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	102	V1	H1	B1	C1	U1	R1	F1	K1	X1	Y1	S102	T102	0	0	N102	G102	KG1	XG1	SK102	0	SE102	TK102	
	97	V21	H21	B21	C21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	86	V18	H18	B18	C18	U18	R18	F18	K18	X18	Y18	0	0	0	0	0	0	KG18	XG18	0	0	0	0	
	76() V0	H0	В0	C0	U0	R0	F0	K0	X0	Y0	0	0	0	0	0	0	KG0	XG0	0	0	0	0	\longrightarrow
Rated C	A) Surrent	1	2	3	5	10	15	1	2	3	5	10	15 16	20	25	30	40	2	3	10	10	10	15 16	
U _r (V Rated V														250										
Prod Struc		ı	- >⊱	Axial	Shape		.					Rac	Jial Shap	oe					Ra	adial Shap	e (Screw H	Hole)		

Thermal-Link (ATCO)-Alloy Type Feature & Model List Overview

	4																					/	\
	230	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	221	0	0		0	0	0	0	0		0	0	0	0	0	0	0		0	0	0	0	
	205	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	200	0	0	0	0		0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	
	187	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
o	160	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
ت	150	0	0	KM7	XM7	Y7	YM7	SM150	TM150	0	KM7	XM7	0	0	HU7	HR7	0	0	HC7	0	HL7	HW7	
5	145	SY145	TY145	0	0	0	0	0	0	0	0	0	0	0	HU6	HR6	HS145	HP145	HC6	HN145	HL6	HW6	
du	139	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
e,	136	0	0	0	0	Y9	YM9	SM136	TM136	Q136	0	0	P136	Q136	0	0	HS136	HP136	0	HN136	0	0	
L	135	0	0	KM5	XM5	0	0	0	0	0	KM5	XM5	0	0	HU5	HR5	0	0	HC5	0	HL5	HW5	3
Rated Functioning Temp. (T_i) $^\circ extsf{C}$	133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Model
o	130	SY130	TY130	KM4	XM4	Y4	YM4	0	0	0	KM4	XM4	0	0	HU4	HR4	0	0		0	HL4	HW4	<u>e</u>
퍙	125	SY125	TY125	0	0	0	0	0	0		KM3	XM3	P125	Q125	HU3	HR3	HS125	HP125	НС3	HN125	HL3	HW3	
Š	123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
匝	120	SY120	TY120	0	0	0	0	0	0		0	0	0		0	0	0	0	0		0	0	
eq	115	SY115	TY115	0	0	0	0	SM115	TM115	Q115	0	0	P115	Q115	HU2	HR2	0	0	HC2	0	HL2	HW2	
lat	105	SY105	TY105	0	0	0	0	0	0		0	0	0		0	0	0		0	0	0	0	
œ	102	0	0	0	0	0	0	SM102	TM102	0	0	0	P102	Q102	HU1	HR1	0	0	HC1	0	HL1	HW1	
	97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	95	SY95	TY95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	86	0	0	0	0	0	0	0	0	0	0	0	0	0	HU18	HR18	0	0	HC18	0	HL18	HW18	
	76() 。	0	0	0	0	0	0	0	0	0	0	0	0	HU0	HR0	0	0	HC0	0	HL0	HW0	
r (A		10	15	2	3	5	5	10	15 16	25	2	3	20	25	10	15	5	10	5	15	10	15	
U _r (V.	AC)	2	50				300				33	20	40	00		50	00		69	90	8	00	
Prod Struc		Cylir	drical					Ra	adial Sha	pe					Axial	Shape		Shape	Axial	Axial Shape (Flat Electrode)		Šhape	

Thermal-Link (ATCO)-Alloy Ty	pe Feature & Model List	Overview
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Prod	luct iture						L				> (]											
U _r (V	Urrent DC) Oltage			50										6	0							
/ r (A)	1	2	3	5	7	1	2	2.5	3	3	5	4	5	6	8	8.5	9	10	10	R0 15	15
	86 76	V18	H18 H0	B18 B0	C18 C0	0	0	0	V18	0	0	0	0	0	C18	0	0	0	0	U18 U0	R18	0
	95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	97	V21	H21	B21	C21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
_	102	V1	H1	B1	C1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	U1	R1	0
9	105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ie c	115	V2	H2	B2	0	C2	0	0	0	0	SF2	0	V2	0	0	C2	0	0	0	U2	R2	0
Kated Functioning Temp. (7:)	120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
n N	123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	125	V3		В3	0	C3	0	НЗ	0	0	0	0	0	0	0	0	0	0	0	U3	R3	0
0	130	V4	H4	B4	0	C4	0	0	0	0	SF4	0	V4	0	0	0	0	0	0	U4	R4	0
Ĭ	133	V8	H8	B8	0	C8	0	0	0	0	SF8	0	V8	0	0	0	0	0	0	0	0	0
_ D	135	V5	H5	B5	0	C5	0	0	0	0	0	0	0	0	0	0	0	0	0	U5	R5	0
e	136	V9	H9	В9	0	C9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ġ.	139	V13	H13	B13	0	C13	0	0	0	0	0	SF13	V13	0	0	0	C13	M13	0	0	0	CR13
ت	145	V6	H6	B6	0	C6	0	0	0	0	0	0	0	0	0	0	0	0	C6	U6	R6	0
	150	V7	H7	B7	0	C7	0	0	0	0	0	0	0	0	0	0	0	0	0	U7	R7	0
ر	187 160	0	0	0	0	0	O V16	O H16	0	O B16	0	0	0	O C16	0	0	0	0	0	U16	O R16	0
	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	205	0	0	0	0	0	V32	H32	0	B32	0	0	0	C32	0	0	0	0	0	U32	R32	0
	221	0	0	0	0	0	V31	H31	0	B31	0	0	0	C31	0	0	0	0	0	U31	R31	0
	230	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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NB Series

Thermal-Link (ATCO)-Alloy Type Feature & Model List Overview

	4																	/	<u> </u>	
7,) °C	230	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	221	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
	205	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	200	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	1	
	187	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	150	0	0	0	0	0	0	S150	T150	0	0	SD150	TD150	PD150	QD150	HS150	HP150	HN150		
р. (145	0	0	0	0	F6	X6	0	0	0	0	0	0	0	0	0	0	0	4	
Rated Functioning Temp. (T,) °C	139	0	0	0	0	F13	0	0	O	0	0	0	0	0	0	0	0	0		
	136	0	0	0	0	0	X9	S136	T136	P136	Q136	SD136	TD136	PD136	QD136	HS136	HP136	HN136	Model	
	135 133		0	0	0	F8	0	0	0	0	0	0	0	0	0	0	0	0		
	130	0	0	0	0	F4	0	0	0	0	0	SD130	TD130	PD130	QD130	0	0	0		
	125	KG3	XG3	К3	Х3	0	0	S125	T125	P125	Q125	SD130	TD130	PD130	QD130	HS125	HP125	HN125	-	
	123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
	120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	115	KG2	XG2	K2	X2	F2	0	S115	T115	P115	Q115	SD115	TD115	PD115	QD115	0	0	0		
	105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	102	KG1	XG1	K1	X1	F1	0	S102	T102	P102	Q102	SD102	TD102	PD102	QD102	0	0	0		
	97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	86	KG18	XG18	K18	X18	F18	0	0	0	0	0	0	0	0	0	0	0	0		
	76) 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\rightarrow	
/ _r (A) Rated Current		2	3	2	3	3	4	10	15 16	20	25	10	15 16	20	25	5	10	15		
U _r (VDC) Rated Voltage		60						100 120				125				200				
Product Structure			Shape v Hole)						Radial Shape								Axial Shape (Flat Electrode)			