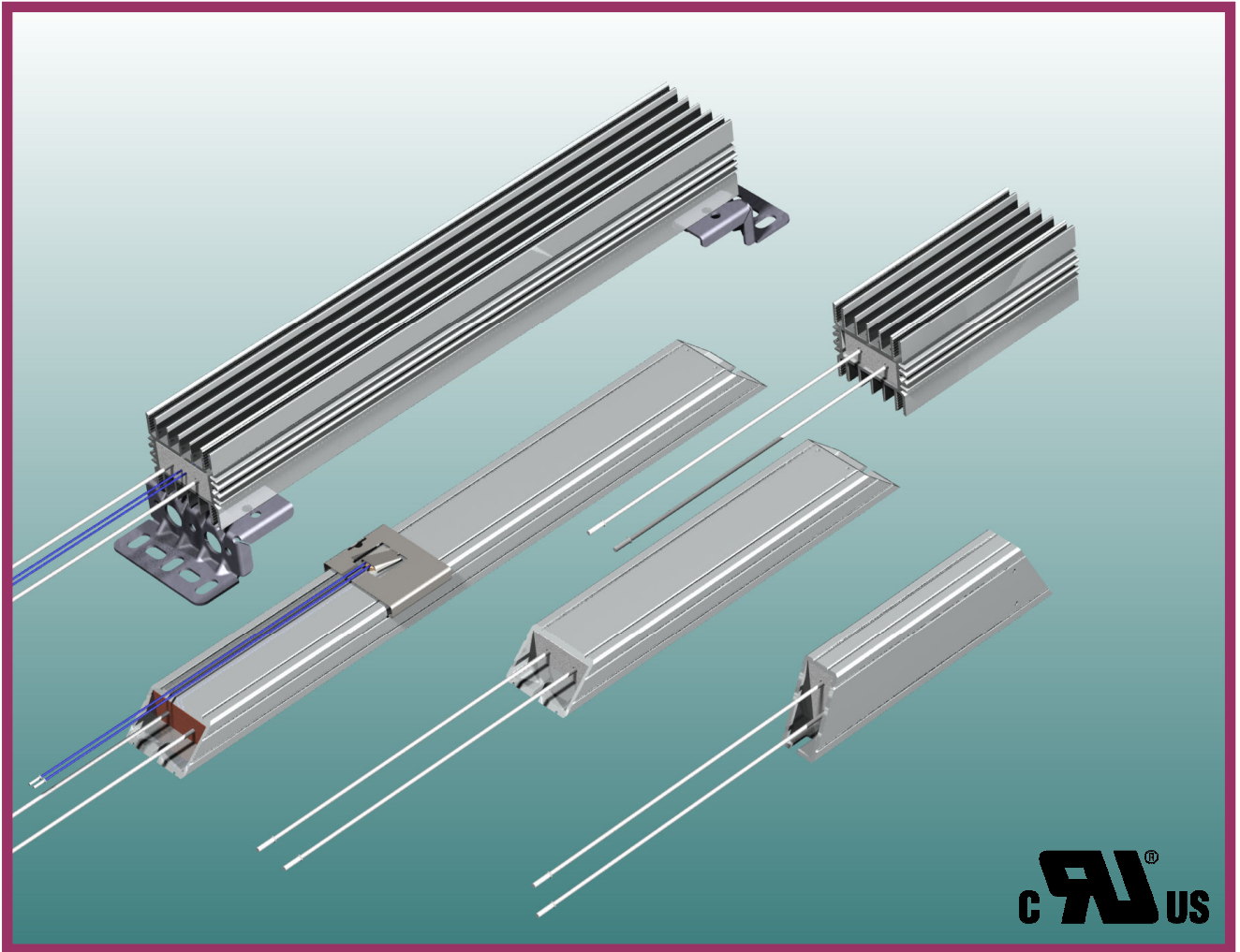


# α ALPHA

## CAH / CAV / CAR

ALUMINIUM HOUSED  
COMPACT BRAKE RESISTORS



**CAH, CAV and CAR** belonging to our smallest range of **ALPHA ALUMINIUM HOUSED COMPACT BRAKE RESISTORS** are electrically insulated and with small dimensions so that they easily can be fitted into compact constructions. They are especially designed to endure high pulse loads compared to the average load.

The steady state power range span from **55W to 350W** and they can withstand pulse loads of up to 75 times these values for one second every 120 seconds!

The resistors comply with IP50 giving electrical and thermal protection. The resistors are silicone free.

Danotherm has developed **thermal models** for all resistor types and resistor values. By using these models we are able to predict the temperature rises in the resistor wire and on the surface for all possible load applications. We offer our assistance to our customers to find the optimum solution for any situation.

All types can be offered with thermo watch.

This range is generally approved to UL 508 (E 208678), please consult Danotherm (CAR Pending).

### Construction

The resistors are designed as follows:

The resistor elements are wire wound on mica support sheets. Lower ohmic values are however made with helix wound elements mounted in a ceramic support part. The outer housing is an aluminium profile isolated with micanite sheets on all inner surfaces. The resistor elements are fixed symmetrical in the profile by the mica construction. This ensures a symmetric expansion of the resistors and a maximum stability to high load impulses. The aluminium profile with the fixed resistor element is filled with quartz sand. This ensures a minimum change of the resistor surface temperature even if the resistor element reaches its maximum temperature during a pulse load.

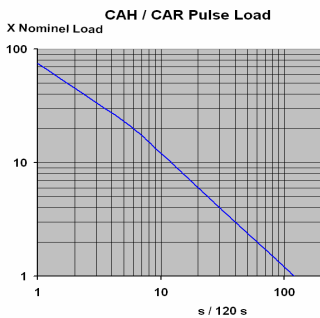
The standard cables are 300 mm AWG 16/14 Style 1659 PTFE, nature colour. We can supply cables in specified lengths, colours and mounted with cable shoes or connectors. If screw terminals are required please see special data sheet. (CAR-DT/CAR-KT)

The resistors are approved to UL 508 for USA and Canada. All thermal data in this data sheet comply with UL 508 (no further reduction is required)

If higher protection classes are required please use our CCR, CBR or CBT resistors. The highest protection class is IP65 / Type 4X, and the power range is up to 6 kW.

### PULSE LOAD

The curve show the pulse load ability compared to the nominal load for the resistors under the following conditions: The load is a periodic pulse load with a constant period time of 120 second and a pulse width from 1 second to 40 seconds.



For further optimization offers Danotherm individual thermal electric circuit models for all types and ohm values. With these models can the temperatures of the resistor wire and the resistor surface be simulated during any pulse load conditions with standard software like PSpice. Alternatively offers Danotherm to make the thermal simulation for our customers

### Ratings:

Type CAH / CAV Type CAR -V: Profile vertically -H: Profile horizontally,	PN W @40°C Approved UL508 *)	Max Surface temp. °C @40°C	Pulse Load in 1s each 120s P1/120 W @40°C	Pulse Load in 5s each 120s P5/120 W @40°C	Pulse Load in 10s each 120s P10/120 W @40°C	Pulse Load in 40s each 120s P40/120 W @40°C	Time Const. sec. (Steady state)	R Ω ±5%, ±10%
CAH / CAV 120 C H	55	230	2500	890	500	170	1000	0.2 – 20
CAH / CAV 150 C	65	230	3000	1050	600	200	1000	0.5 – 900
CAH / CAV 165 C	75	230	3500	1250	750	250	1000	1.0 – 1000
CAH / CAV 210 C	100	230	5500	1900	1100	310	1000	6.0 – 1000
CAH / CAV 240 C	120	240	6600	2300	1350	350	1000	9.0 – 1000
CAH / CAV 300 C	155	250	12000	3350	1850	410	1000	12 – 1000
CAH / CAV 360 C	190	270	14000	4350	2350	550	1000	15 – 1000
CAR 85 C H	100	260	6000	1700	950	260	1000	0.2 – 20
CAR 115 C	135	270	8100	2290	1280	350	1000	0.5 – 900
CAR 130 C	155	272	9300	2630	1470	400	1000	1.0 – 1000
CAR 175 C	195	265	11700	3310	1850	500	1000	6.0 – 1000
CAR 205 C	225	265	13500	3830	2140	580	1000	9.0 – 1000
CAR 265 C	285	268	17100	4840	2700	740	1000	12 – 1000
CAR 325 C	350	270	21000	5950	3320	910	1000	15 – 1000

Pulse Ratings for short pulses depend on the ohmic value. (Resistors with lower resistance values have more resistor wire than resistors with higher resistance values). The ratings in this table refer to resistors of about 40 OHMS.

### General Specifications

Temperature Coefficient:	<±100ppm
Dielectric strength:	3500VAC 1 minute
Working Voltage:	UL: 600VAC / CE: 690VAC; 1100VDC
Isolation Resistance:	> 20 MΩ
Overload:	10-12 x in10 sec; 50 - 75 x in 1 s
Environmental:	-40 °C – 90 °C
De-rating :	Linear: 40°C = P <sub>N</sub> to 90°C = 0.75*P <sub>N</sub>
Thermo watch, CAH and CAV:	External, mounted with CLIP-ON bracket or internal in +25mm long housings: 200°C (Optional: 130°C/160°C/180°C), 2A, 250VAC NC
Thermo watch CAR	Internal in +25mm long housings: 200°C (Optional 130°C/ 160°C/180°C), 2A, 250VAC, NC
Approvals	UL 508

PN: NOMINAL POWER WITH NATURAL COOLING and:

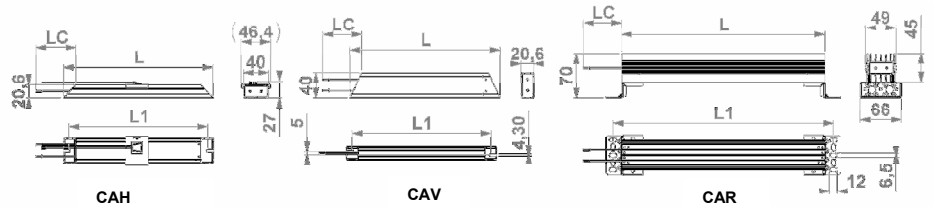
For CAV and CAH mounted in a horizontal position

For CAR mounted in a vertical position

Color code for thermo watch cables: 130°C: brown/ 160°C: blue/ 180°C: orange/ 200°C: white

\*) UL approval of CAR is pending. Please consult Danotherm

### Mechanical Data



The CAH is shown with external CLIP-ON thermo watch TW.

External CLIP-ON thermo watch is also available for CAV.

Internal thermo watch (TW) for all types require 25 mm extra length of the aluminium housing!

Type	L ± 2	L1 ± 2	Weight g	Type	L ± 2	L1 ± 2	Weight g
CAH / CAV 120 C	120	102	160	CAR 85 C	85	115	200
CAH / CAV 150 C	150	132	185	CAR 115 C	115	145	280
CAH / CAV 165 C	165	147	220	CAR 130 C	130	160	300
CAH / CAV 210 C	210	192	315	CAR 175 C	175	205	380
CAH / CAV 240 C	240	222	370	CAR 205 C	205	235	530
CAH / CAV 300 C	300	282	460	CAR 265 C	265	295	600
CAH / CAV 360 C	360	342	550	CAR 325 C	325	355	740

### Type identification:

**CAR 175 C (H)(T) 22R 081**

(X): Only part of ID number if option is chosen

800: CAH and CAV: Standard / CAR: 001 = No TW / 081 = 200 °C TW / 071 =

180 °C TW / 061 = 160°C TW / 051 = 130°C TW / XXX > 400 for customer

specified versions

Ohm Value (Examples: 2R2=2.2Ω; 22R=22 Ω; 220R=220Ω; 2K2 = 2.2 kΩ)

T = Internal Thermo Watch, 130, 160, 180 or 200°C

H: helix shape winding (only specified by Danotherm).

C: Cable connections

Length of resistor profile in mm.

NON UL Versions CAH~~X~~ 165 C 22R 800