



GCH and GCH1 belonging to our medium range of Alpha Aluminum Housed Compact Brake Resistors are electrically insulated and with small dimensions so that they can easily 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 100W to 1045W and they can withstand pulse loads of 40 times these values for one second every 120 seconds! The very flat construction of GCH makes it ideal suitable for heat sink cooling and can be used in liquid cooled equipment. Improvement in the cooling of the resistor will naturally enhance its power capability.

KWX has developed thermal models for all resistor types and resistor values. By using these models we are able to predict the temperature rises of 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.

The GCH and GCH1 are available in two versions with different protection degrees: IP50 or IP65. They are both Silicone free.

GCH can be equipped with external SCREW-ON thermo watch. Both types can be offered with internal thermo watch, please see separate datasheet.

## Construction

The resistors are designed as follows:

The resistor elements are wire wound on mica support sheets. The outer housing is an aluminium profile insulated 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 or MgO. 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 length, colours and mounted with cable shoes or connectors.

The resistors are approved to UL508 for USA and Canada. All thermal data in this data sheet complies to UL 508 (no further reduction is required)

## Ordering Information

Type identification:

GCH 326 (M) C 22R 800

( ): Only if these features are present

800 = Standard, otherwise customer specified version

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

Terminals: C: Cable, W: Cables and IP65 (UL: Type 4X)

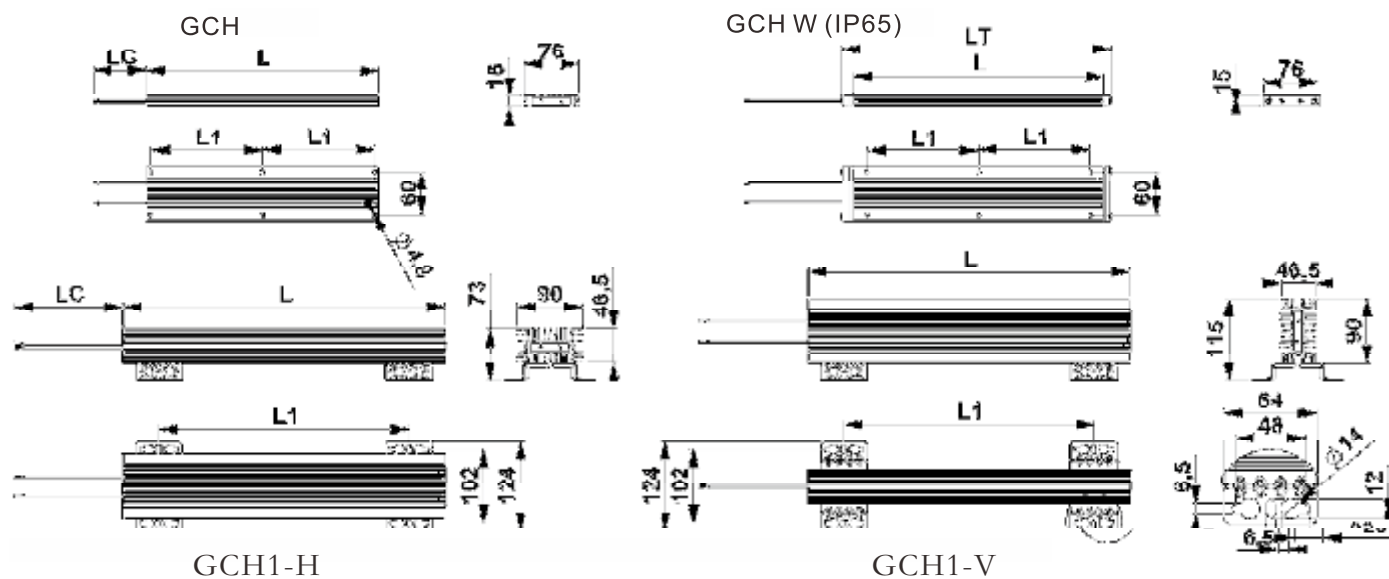
M MgO filling, (specified by KWX)

Length of resistor profile in mm.

Type GCH, GCH1

NON UL versions: GCH X 320 C 22R 800

## Dimensions

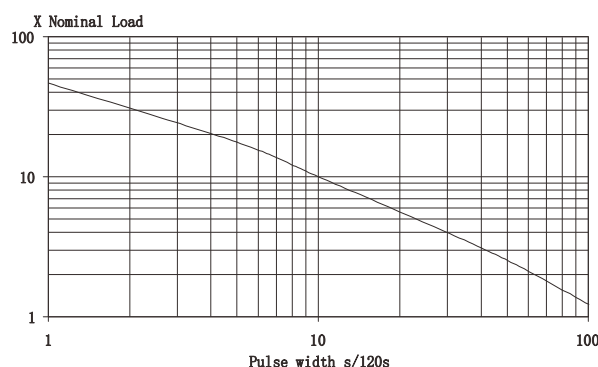


Type	L 2mm	L1 0.5mm	IP65 L 2mm	W kg	Type	L 2mm	L1 2mm	IP65 L 2mm	IP65 L1 2mm	W kg
GCH 110	110	98	14	0.22	GCH1-H/GCH1-V 116	116	-	145	-	0.52
GCH 166	166	154	20	0.35	GCH1-H/GCH1-V 172	172	72	201	91	0.78
GCH 216	216	204	25	0.48	GCH1-H/GCH1-V 222	222	122	251	141	1.00
GCH 270	270	258	3	0.62	GCH1-H/GCH1-V 276	276	176	305	195	1.25
GCH 320	320	2x154	35	0.79	GCH1-H/GCH1-V 326	326	226	355	245	1.47
GCH 420	420	2x204	45	1.05	GCH1-H/GCH1-V 426	426	326	455	345	1.92
GCH 520	520	2x241.5	555	1.30	GCH1-H/GCH1-V 526	526	426	555	445	2.37
GCH 620	620	2x291.5	655	1.55	GCH1-H/GCH1-V 626	626	526	655	545	2.83

The IP 65 versions require longer aluminium profiles (L): GCH W +35mm; GCH1 W +29mm. The total resistor length (LT) will be additional 27mm longer than the profile length (L).  $LT = L + 27mm$ .  
 GCH and GCH W have the same distance L1 between the mounting points.  
 GCH for heat sink cooling requires extra mounting holes to assure sufficient thermal contact. The distance between mounting points (L1) should be about 100mm and can be made according to customer specification.  
 The table shows our standard sizes, other sizes are possible. The weight in the table refers to IP 50 versions.

## Derating Curve

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 seconds and a pulse width from 1 to 120 seconds.



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

## Applications And Ratings

TYPE GCH GCH1-H Profile Horizontally GCH1-V Profile Vertically	PN W @40C Approved UL508	Max Surface temp. C @40C	Pulse Load in 1s each 120s P1/120 kW @40C	Pulse Load in 5s each 120s P5/120 kW @40C	Pulse Load in 10s each 120s P10/120 kW @40C	Pulse Load in 40s each 120s P40/120 W @40C	Time Const sec.	R (5%) 10%
GCH 110	100	250	2	1.8	1.0	300	1000	2-1000
GCH 166	160	255	3.2	2.88	1.6	480	1000	4-1200
GCH 216	200	255	4	3.6	2.0	600	1000	6-1500
GCH 270	260	255	5.1	4.59	2.55	770	1000	9-1700
GCH 320	300	260	6	5.4	3.0	900	1000	10-2000
GCH 420	390	270	7.8	7.02	3.9	1170	1000	13-2000
GCH 520	480	285	9.6	8.64	4.8	1440	1000	16-2000
GCH 620	570	295	11.4	10.2	5.7	1710	1000	20-2000
GCH1-H/GCH1-V 116	185	250	4.5	2.5	1.2	550	1000	2-1000
GCH1-H/GCH1-V 172	260	250	11	3.5	2.5	1000	1000	4-1200
GCH1-H/GCH1-V 222	330	255	15.5	4.45	3.75	1300	1000	6-1500
GCH1-H/GCH1-V 276	400	260	18	5.4	4.5	1800	1000	9-1700
GCH1-H/GCH1-V 326	500	265	23	6.7	5.9	2000	1000	10-2000
GCH1-H/GCH1-V 426	635	275	28	8.57	7.0	2700	1000	13-2000
GCH1-H/GCH1-V 526	815	285	38	11	9.0	3500	1000	16-2000
GCH1-H/GCH1-V 626	1045	290	43	14.1	11	4500	1000	20-2000

## Performance Characteristics

Temperature Coefficient:	<100ppm
Dielectric strength:	3500VAC 1 minute
Working Voltage:	UL: 600V ; CE: 690VAC; 1100VDC
Isolation Resistance:	> 20 M
Overload:	10 x in 10s / 120s; 40 x in 1s / 120s
Environmental:	-40 C 90°C
De-rating :	Linear: 40° C = PN to 90° C = 0.75*PN
Thermo watch (external) :	200° C (Optional 130° C/160° C/180° C), 2A, 250VAC, NC
Approvals	UL 508

PN: Nominal Power With Natural Cooling Withuut Internal Thermo Watch and:  
GCH mounted in a horizontal position; GCH1-V and GCH1-H mounted in a vertical position.  
For data for resistors with internal thermo watch, please ask for special data sheet.