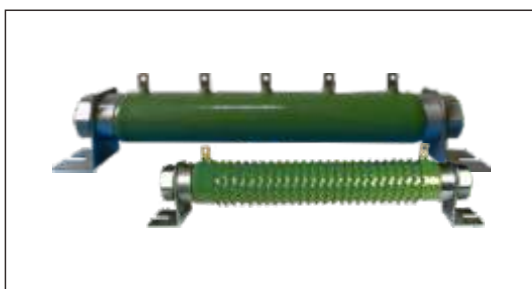
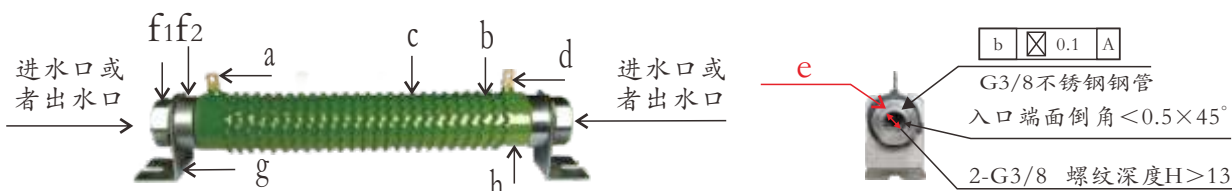


# HWA水冷型功率瓷管电阻器 Water-cooling High Power Ceramic Tube Resistors



本体颜色: Body Color  
 标准品: Standard (Green 绿色)  
 标示: Marking  
 (根据客户要求提供相应标识)  
 (According to the customer request to provide corresponding identification)

## ● 结构图 Construction



ad	b	c	e	g	f <sub>1</sub> , f <sub>2</sub>	h
接线端子	环氧树脂绝缘层	合金丝	不锈钢管接口	不锈钢支架	不锈钢配件	高铝瓷管
Terminal block	Epoxy resin insulating layer	Alloy wire	2-G3/8 Internal thread Stainless Interface	Stainless steel bracket	Stainless steel fittings	Alumina porcelain

## ● 特性 Feature

- I 水冷型设计, 冷却水从瓷管内流过, 带走电阻工作时产生的热量, 增加电阻功率和延长电阻寿命  
 Water cooled type design, cooling water flow from the ceramic tube, take away the heat generated by the resistor works, strengthen the power of resistor and extend the life of the resistor
- II 产品选择表面立式波纹, 有利于散热、减小寄生电感, 耐大电流冲击。  
 The product surface with solid wave type, which will help to reduce the stray inductance and withstand high current surge.
- III 过负荷能力强, 热稳定性好, 使用寿命长。  
 Good overload and heat durability capacity, the useful time is longer than the others.
- IV 精度范围: ±5%、±10%  
 Resistance tolerance: ±5%、±10%

## ● 参考规格 Reference Standards

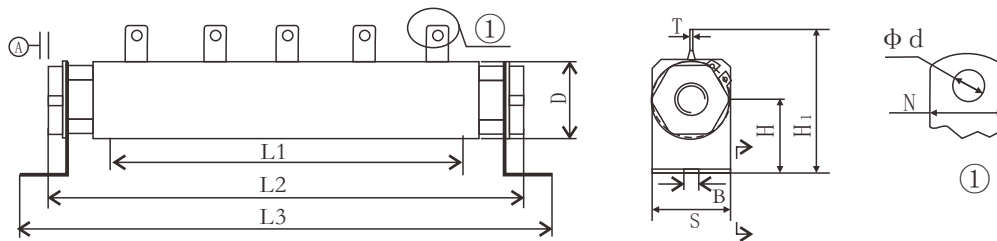
JIS C 5201-1

## ● 料号编号 ordering Information

例 example

HWA	300	J	10R00	A
产品名称 Product Name	功率 Power	精度 Tolerance	阻值 Resistance	特殊码 Special code
水冷型功率瓷管电阻器 Water-cooling High Power Ceramic Tube Resistors	50B=50W 100=100W 300=300W 400=400W	J=±5% K=±10%	0R100=0.1Ω 0R200=0.2Ω 10R00=10Ω 10K00=10KΩ	A1 不带支架 A1 Without brackets A2 带支架 A2 With brackets

## 规格尺寸 Specifications and Dimensions



规格 Type	功率 Power	外形尺寸 Dimensions (mm)										
		L <sub>1</sub> ±2	L <sub>2</sub> ±5	L <sub>3</sub> ±3	D±2	B±1	H±1	H <sub>1</sub> ±3	S±2	N±2	φ d±1	T±0.5
HWA	20W	62	84	100	20	5	25	34	20	6	3.5	1.0
HWA	30W	82	104	120	20	5	25	34	20	6	3.5	1.0
HWA	50W	102	124	146	28	6.5	28	68	28	8	4.5	1.5
HWA	60W	102	124	146	28	6.5	28	68	28	8	4.5	1.5
HWA	80W	152	174	196	28	6.5	28	68	28	8	4.5	1.5
HWA	100W	182	204	226	28	6.5	28	68	28	8	4.5	1.5
HWA	150W	225	247	270	28	6.5	28	68	28	8	5.5	2.0
HWA	200W	225	247	270	28	6.5	28	68	28	8	5.5	2.0
HWA	300W	285	304	345	40	6.5	40	85	40	10	5.5	2.0
HWA	400W	316	338	375	40	6.5	40	85	40	10	5.5	2.0
HWA	500W	318	338	378	50	6.5	45	100	50	10	6.0	2.0
HWA	600W	348	368	408	50	6.5	45	100	50	10	6.0	2.0
HWA	750W	303	330	368	60	8.5	58	115	60	12	6.0	2.0
HWA	900W	303	330	368	60	8.5	58	115	60	12	6.0	2.0
HWA	1000W	433	460	500	60	8.5	58	115	60	12	6.0	2.0
HWA	1200W	418	445	485	60	8.5	58	115	60	12	6.0	2.0
HWA	1400W	418	445	485	60	8.5	58	115	60	12	6.0	2.0
HWA	1500W	433	460	500	70	8.5	65	125	70	15	6.0	2.0
HWA	1800W	513	540	580	60	8.5	60	119	60	12	6.0	2.0
HWA	2000W	433	475	525	80	8.5	82	170	80	15	6.5	2.0
HWA	2400W	603	630	670	60	8.5	60	119	60	12	6.0	2.0
HWA	2500W	433	475	525	80	8.5	82	170	80	15	6.5	2.0
HWA	3000W	433	475	525	100	8.5	82	170	100	15	6.5	2.0
HWA	5400W	505	448	525	150	10	120	230	150	20	8.5	2.0
HWA	10000W	900	925	980	150	10	120	230	150	20	8.5	2.0

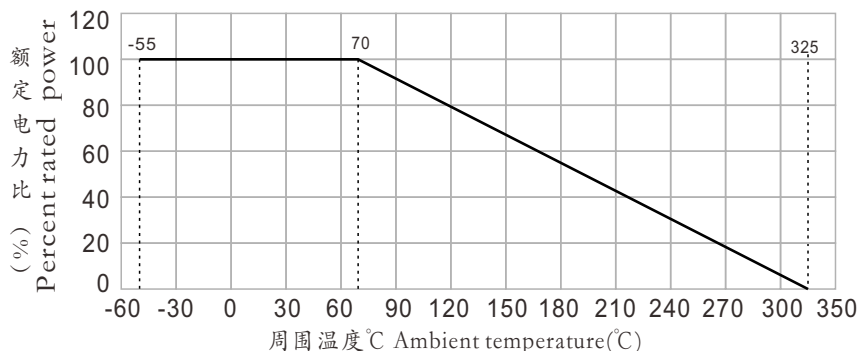
备注:具体规格尺寸可以根据客户的需求制作,同时也可以制作一管多个阻值,也可按客户要求取消固定支架。

Note: We can according customer requirements to customize the specification and dimension, also can product multiple resistance value of one ceramic tube or cancel the fixed plank.

可协议生产2500W~15000W电阻。Our factory can also produce 2500W~15000W non-standard resistors according to the requirement

## 额定温度下降曲线图 Derating Curve

例 Example



## ● 功率、阻值范围与耐电压 Power And Resistance etc

规格 Type	功率 Power (W)	阻值范围 Resistance Range( $\Omega$ )	误差值 Tolerance	温度系数 T.C.R PPM/ $^{\circ}$ C	最高使用电压 Max Working Voltage (V)	最高负荷电压 Max Overload Voltage (V)	使用温度范围 Operating Temp.Range
HWA	20W	0.1~100	J $\pm$ 5% K $\pm$ 10%	$\pm$ 350	$\sqrt{P \cdot R}$	$6.25\sqrt{P \cdot R}$	-55 $^{\circ}$ C ~ 325 $^{\circ}$ C
HWA	30W	0.1~100					
HWA	50W	0.15~100					
HWA	60W	0.15~100					
HWA	80W	0.2~100					
HWA	100W	0.3~100					
HWA	150W	0.36~200					
HWA	200W	0.43~200					
HWA	300W	0.43~200					
HWA	400W	0.43~300					
HWA	500W	0.5~300					
HWA	600W	0.5~300					
HWA	750W	0.5~500					
HWA	900W	0.5~500					
HWA	1000W	0.5~500					
HWA	1200W	0.5~500					
HWA	1400W	0.5~500					
HWA	1500W	0.5~500					
HWA	1800W	0.5~500					
HWA	2000W	0.5~500					
HWA	2400W	0.5~500					
HWA	2500W	0.5~1000					
HWA	3000W	0.5~1000					
HWA	5400W	0.5~1000					
HWA	10000W	0.5~1000					

## ● 性能 Performance

试验项目 Test Items	性能 Performance	试验方法 Test Methods(JIS C 5201-1)
温度系数 Temperature coefficient	$\pm$ 350PPM/ $^{\circ}$ C	在常温及常温+100 $^{\circ}$ C时分别测量电阻并计算每度的阻值变化率。 Test resistance value at normal temperature and normal temperature added 100 $^{\circ}$ C, calculate $^{\circ}$ C resistance value change rate.
短时间负荷 Short-time overload	$\Delta R \leq \pm (2\%R_0 + 0.05\Omega)$	施加10倍额定功率或最高负荷电压(取较小者)5秒。 According 10 times rated power to account the power or max. overload voltage(get the lower) for 5seconds.
耐焊接热 Resistance to soldering heat	$\Delta R \leq \pm (1\%R_0 + 0.05\Omega)$	在350 $\pm$ 10 $^{\circ}$ C的锡炉中浸入2~3秒。 Immerge into the 350 $\pm$ 10 $^{\circ}$ C tin stove for 2~3 seconds
可焊性 Solderability	焊锡面积覆盖率95%以上 The soldering area is over 98%	在245 $\pm$ 3 $^{\circ}$ C的锡炉中浸入2~3秒。 Immerge into the 245 $\pm$ 3 $^{\circ}$ C tin stove for 2~3 seconds
温度循环 Temperature cycle	$\Delta R \leq \pm (2\%R_0 + 0.05\Omega)$	在-55 $^{\circ}$ C时放置30分钟,然后在+25 $^{\circ}$ C时放置10~15分钟,然后再在+155 $^{\circ}$ C时放置30分钟,然后在25 $^{\circ}$ C时放置10~15分钟,共循环5次。At-55 $^{\circ}$ C for 30min, then at +25 $^{\circ}$ C for 10~15min, then at +155 $^{\circ}$ C for 30min, then at +25 $^{\circ}$ C for 10~5, min, total 5cycles.
耐湿负荷寿命 Load life in humidity	$\Delta R \leq \pm (5\%R_0 + 0.1\Omega)$	在温度为40 $\pm$ 2 $^{\circ}$ C,相对湿度为90~95%的恒温恒湿箱中,施加额定电压或最大工作电压(取较小者)共1000小时(通1.5小时,断0.5小时)。Overload rated voltage or Max.working voltage(get the lower)for 1000hours(1.5hours on and half-hour off) at the 40 $\pm$ 2 $^{\circ}$ C and 90~95% relative humidity.
耐温负荷寿命 Load life in heat	$\Delta R \leq \pm (5\%R_0 + 0.05\Omega)$	在70 $\pm$ 2 $^{\circ}$ C恒温恒湿箱中施加额定电压或最大工作电压(取较小者)共1000小时(通1.5小时,断0.5小时)。Overload rated voltage or Max.working voltage(get the lower)for 1000hours(1.5hours on and half-hour off) at the 70 $\pm$ 2 $^{\circ}$ C.
不燃性 Nonflammability	不可有明显火焰 No visible flame	分别按5、10、16倍额定功率加交流负荷5分钟。 Respectively load AC voltage by 5,10,16 times rated power for 5 minutes.

## ● 电气间隙和爬电距离 Electric Clearance And Creepage Distance

各带电电路之间以及带电部件，导电部件之间的电气间隙和爬电距离应符合GB/T3859.1-1993的规定。

Electric clearance and creepage distance,between each electric cricuit, as well as between each live parts,and each conductive parts shall comply with the stipulation of GB/T3859.1-1993

额定电压 Voltage Rating(KV)	电气间隙 Electric Clearance(mm)	爬电距离 Creepage Distance(mm)
0.40	8	14
0.69	12	22
3.15	36	75