HJR High Energy Resistor

Catalogue

Custom HJR High Energy resistor stacks employ heavy-duty components for mechanical mounting, electrical isolation and termination. yielding ratings to thousands of kilojoules of single-surge energy.

High Energy resistors offer unsurpassed performance in high energy and high voltage applications. These non-inductive, ceramic composite resistors are designed for pulse shaping, crowbar, capacitor charg /discharge··· any application requiring low inductance along with extremes of voltage and energy. They are ideally suited for use in pulsed power systems, where these resistors distribute energy uniformly throughout their structure for low thermal stress.The standard, high-temperature silicone coating enhances high voltage performance in air. Optional configurations optimize performance in other gaseous or fluid dielectrics. These resistors are also available as a solid disk without center bore.

Features

Ⅰ.100% Active Material
Ⅱ.High Surge Energy Rating
Ⅲ.High Voltage Withstand
Ⅳ.Essentially Non-Inductive
Ⅴ.Wide Resistivity Range
Ⅵ.Wide Range of Geometries
Ⅶ.Air / Oil / SF6 Environments
Ⅷ Single Disc or Modular Assemblies
Ⅸ.Custom Solutions Readily Available
Ⅹ.Free Design Service

Applications

HJR High Energy resistors are most often usedfor low repetition rate discharge, crowbar, pulse shaping or other impulse duty. In practice, a resistor or combination is selected to yield no more than 100oC rise for the expected applied energy. Because of the large mass, a relatively long cooling time is required between pulses, or additional heat capacity must be allowed for.Our applications spreadsheet (MS Excel,available on diskette) can beused to easily model heat-up and cool-down profiles for your specific application.

Ordering Information

Example:

HJR	30	K	80R00	5P
(1)	(2)	(3)	(4)	(5)
Series Name	Power Rating	Resistance Tolerance	Resistance Value	Series

(1)Style:HJR SERIES

(2)Power Rating: 30=30W、50=50W、75=75W、95=95W.......

(3)Tolerance: K=±10%、M=±20%

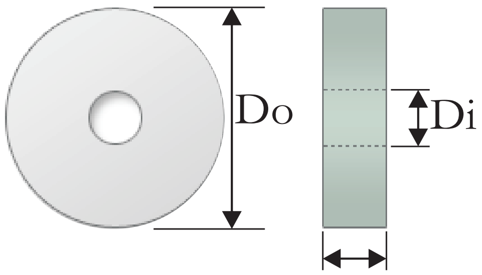
(4)Resistance Value:0R5=0.5Ω、80R00=80R、100R00=100R、

(5)Series:5P=5PCS、8P=8PCS、10P=10PCS

Reference Standards

JIS C 5201-1

Dimensions



Part Part No.	Dimensions(Individual unit)					
	Do mm	Di mm	Thickness mm	volume cm^3	Energy KJ	weight g
HJR30	32±1	11±1	25±1	27	5	90
HJR50	50±1	20±1		42	12	90
HJR75	75±1	34±2		93	28	190
HJR95	95±1	34±2		160	56	190
HJR112	112±1	34±2		220	75	190
HJR125	125±1	34±2		295	85	650
HJR150	150±1	34±2		420	110	950

Power And Resistance etc

Part Part No.	Resistance Range (Ω)	Max. Energy 2 (KJ)	Max. Impulse Volts 3 (kV)
HJR30	0.5-100R	5	18KV
HJR50	0.5-100R	12	20KV
HJR75	0.5-100R	28	24KV
HJR95	0.5~90R	56	26KV
HJR112	0.5~80R	75	27KV
HJR125	0.5~60R	75	28KV
HJR150	0.5~50R	110	30KV

Notes:
1 Custom thickness available,affects ratings
2 Single impulse to cause 125℃ temperature rise
3 Standardized for 50Ω resistor in air, 1.2/50μsec pulse width

Power Dissipation

Heat generated by the High Energy Disk Resistors is dissipated mainly by radiation and convection from the exposed surface areas. Within restricted domains, mathematical models may be employed to permit heat transfer estimations.	
Higher power dissipation is achieved using conduction cooling through either one or both mounting surfaces using:	Air heat sink Water cooled heat sink
Radiation and Convection	$W_a = 0.00026(\Delta T)^{1.4}$ W_a = Watts/Units Exposed Surface Area ($W.cm^{-2}$) ΔT = 50℃ to 175℃, D_o =1.9 to 15.1 cm, Ambient 25℃
Recommended Operation Temperatures	Disc diameters ⩽ 11.2 cm ⩽ 300 ℃ (Infrequent Operation) Disc diameters > 11.2 cm ⩽ 250 ℃ (Infrequent Operation) All Disc diameters ⩽ 150℃ (Continuous Operation)

Impulse Voltage

Maximum impulse voltage is a function of:	Mainly—Resistance value and pulse width Lesser Extent—Surface temperature and dielectric medium
Resistivity Range—ϱ	3Ω cm to 30000Ω cm ϱ = R x A/L R = Resistance value, A = Surface area, L = Length
Temperature Coefficient	-0.05% to －0.15% per ℃ rise(depending on Resistivity value)
Voltage Coefficient	-0.5% to －7.5% per kV/cm(for ϱ domain 10Ω cm to 7500Ω cm)
Maximum Working Voltage Withstand per cm of Disk Length (V_{wk})	SF6 $V_{wk} = 8.0 \times \sqrt[1.2]{Log(R/2.54 \times A/L)}$ kV/cm 1.2/50μs Waveform AIR $V_{wk} = 4.3 \times \sqrt[1.2]{Log(R/2.54 \times A/L)}$ kV/cm 1.2/50μs Waveform AIR $V_{wk} = 3.0 \times Log(R/2.54 \times A/L)$ kV/cm 50/1000μs Waveform AIR $V_{wk} = 1.5 \times (Log(R/2.54 \times A/L))^{1.25}$ kV/cm 100/10000μs Waveform

Derating Curve

Maximum impulse voltage is mainly a function of resistance value and pulse width, and to a lesser extent, surface temperature and dielectric medium. The chart below shows the range of maximum impulse voltage for the standardized 1.2/ 50 μsec. pulse width in air.,which indicates the range and relative impulse ratings for thevarious standard sizes.Our applications group can assist you in assessing the correct parameters for your application.