

# FHR 2/4-8065 80110 80216 80320 80370

Precision Power Shunt Resistors



- Resistances from 0.001Ohm to 500Ohms
- Power Rating to 2500Watt
- Resistance Tolerances to  $\pm 0.1\%$
- TCR to  $\pm 15\text{ppm/K}$
- Load Stability to 0.1%
- Very Low Inductance (<50nH)

## SPECIFICATIONS

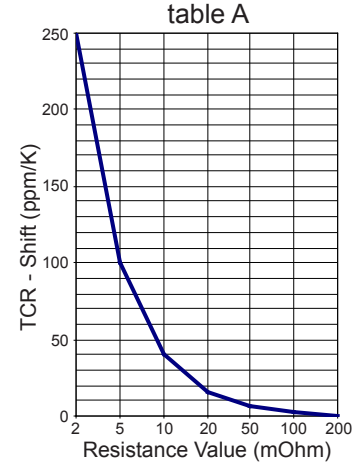
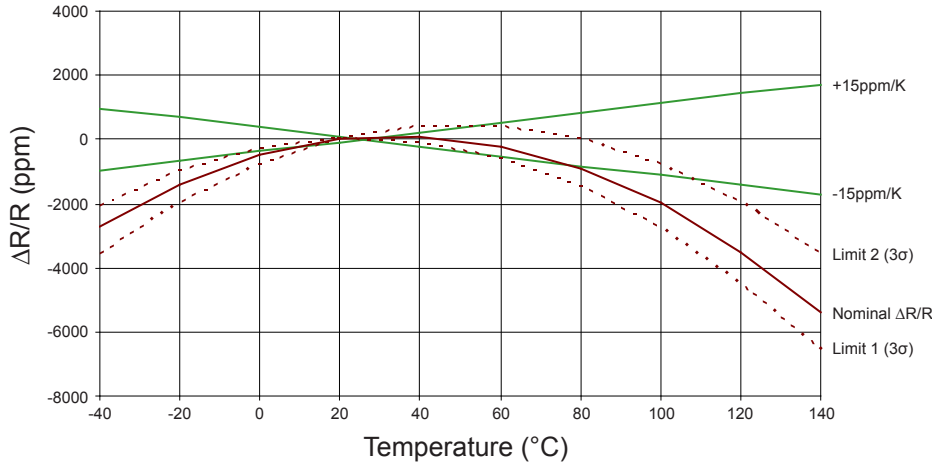
Type	8065	80110	80216	80320	80370
Resistance Range	0.001 to 400Ohms	0.001 to 500Ohms			
Power rating free air 25°C with heatsink	24 W 350 W	32 W 600 W	60 W 1200 W	80 W 2000 W	90 W 2500 W
Thermal Resistance Rthj-c	0.16 K/W	0.09 K/W	0.04 K/W	0.026 K/W	0.022 K/W
Tolerances (4 terminal version) from 0.001 Ohms from 0.01 Ohms from 0.02 Ohms	0.5% / 1% / 2% / 5% 0.25% / 0.5% / 1% / 2% / 5% 0.1% / 0.25% / 0.5% / 1% / 2% / 5%				
Tolerances (2 terminal version)	0.5% / 1% / 2% / 5%				
Stability	0.1% / 0.2% / 0.5% (depends on stress)				
Temperature Coefficient (4 terminal version)	$\pm 15\text{ppm/K}$ (20 to 60°C) from $R \leq 0.02$ Ohms $\pm 20\text{ppm/K}$ (20 to 60°C) from $R \leq 0.01$ Ohms $\pm 30\text{ppm/K}$ (20 to 60°C)				
Temperature Coefficient (2 terminal version)	$\pm 15\text{ppm/K}$ (20 to 60°C) $\pm 50\text{ppm/K}$ (-40 to 130°C) $R \leq 0.2$ Ohms TCR see table A next page				
Max. Current	60 A upon request special cable up to 250 A				
Inductivity	< 50 nH				
Capacity against housing	500 pF	850 pF	1.7 nF	2.5 nF	2.9 nF
Insulation Strength	1.5 kVDV (higher upon request)				
Thermal EMF	< 0.1 $\mu$ V/K				
Operating Temperature Range	-40 to 130°C				
Resistor Material	CuNiMn-Foil				
Substrate	anodized aluminium				
Housing	anodized aluminium				
Connector Material	Cu-Cable / 4mm <sup>2</sup> / 500mm length (other upon request / AWG possible)				
Terminals	2 or 4				

## Ordering Information

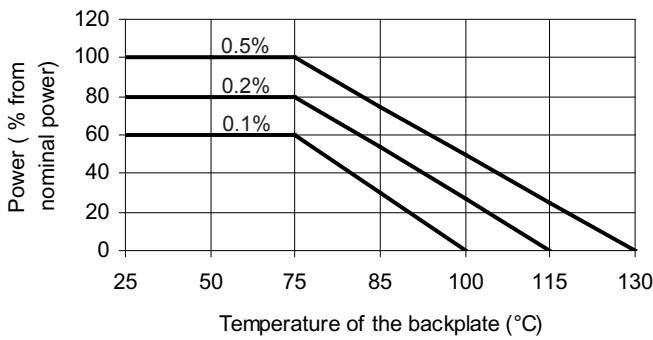
Part Number - Resistance - Contact - Tolerance  
FHR 4-80216 1.0 Ohms D 1%

**SPECIFICATIONS** (continued)

**Temperature Coefficient**



**Derating**



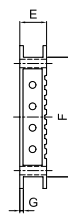
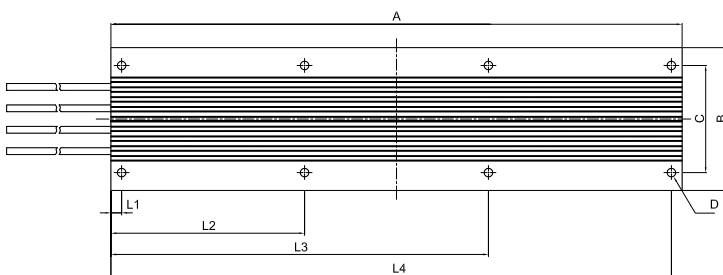
**Power Rating Notes -**

The FHR Series Resistors must be attached to a suitable heat-sink. The maximum internal resistor temperature is 130°C. To specify an appropriate heatsink use the following formula :

$$R_{\theta H} = \frac{T_{MAX} - (P \times R_{\theta R}) - T_A}{P}$$

Where:  $R_{\theta H}$  = Thermal Resistance of Heatsink ( K/W )  
 $R_{\theta R}$  = Thermal Resistance of Resistor ( K/W )  
 $T_{MAX}$  = Maximum Temperature of Resistor  
 $T_A$  = Ambient Temperature of Heatsink ( °C )  
 $P$  = Power Through Resistor ( W )

**Dimensions**



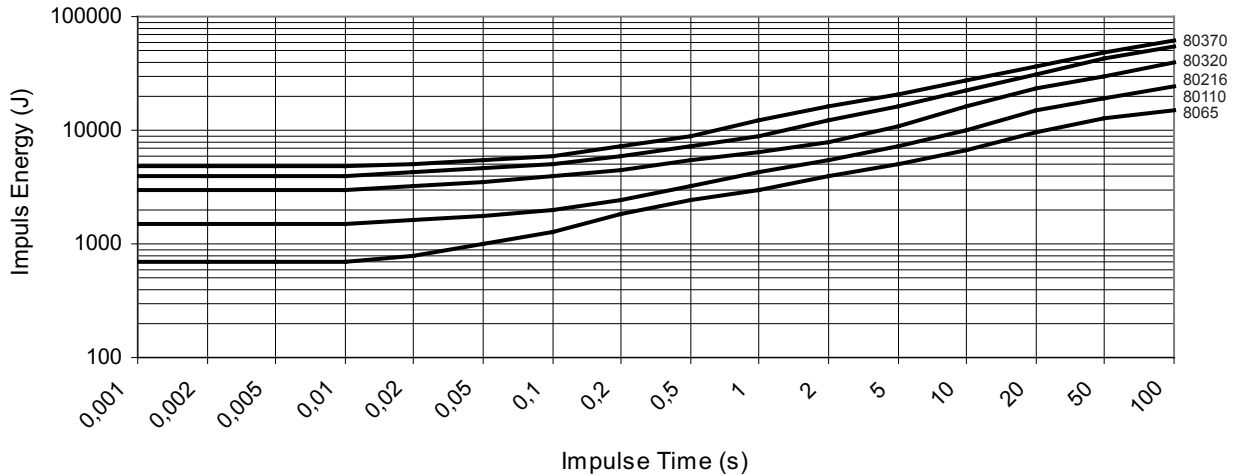
Dimension	mm	tol. (±mm)	inches	tol. (±inches)
B	80.00	0.3	3.15	0.012
C	60.00	0.3	2.36	0.012
D	Ø4.75	0.2	Ø0.19	0.008
E	15.00	0.2	0.59	0.008
F	67.00	0.3	2.64	0.012
G	2.00	0.1	0.08	0.004

Dimension	8065 mm	80110 mm	80216 mm	80320 mm	80370 mm	tol. (±mm)	8065 inches	80110 inches	80216 inches	80320 inches	80370 inches	tol. (±inches)
A	65.00	110.00	216.00	320.00	370.00	0.3	2.56	4.33	8.50	12.60	14.57	0.012
L1	6.00	6.00	6.00	6.00	6.00	0.3	0.24	0.24	0.24	0.24	0.24	0.012
L2	59.00	104.00	108.00	108.50	125.50	0.3	2.32	4.09	4.25	4.27	4.94	0.012
L3			210.00	211.50	244.50	0.3			8.27	8.33	9.63	0.012
L4				314.00	364.00	0.3				12.36	14.33	0.012

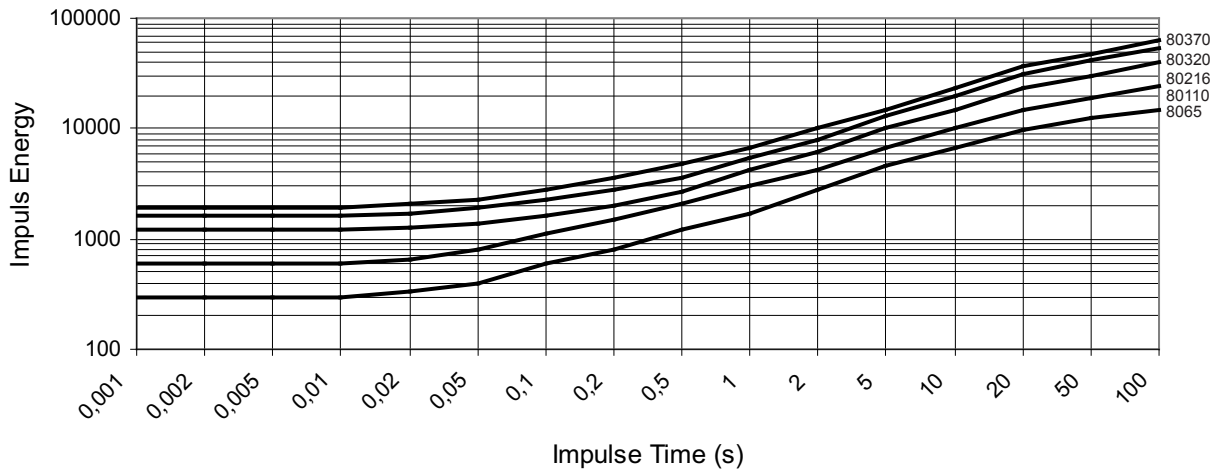
**SPECIFICATIONS** (continued)

**Stability against Impulses**  
Reference values without heatsink

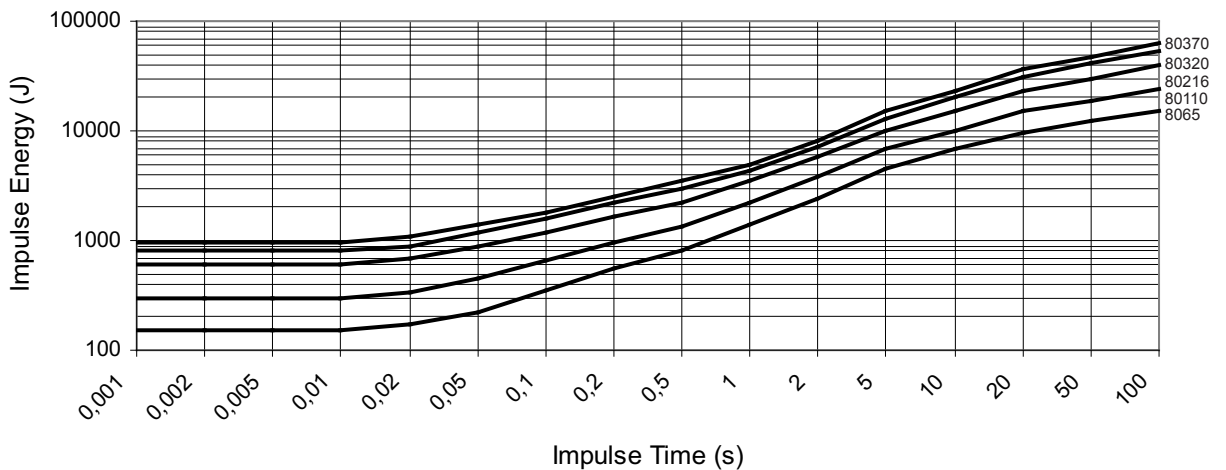
Resistance value R001 to R002



Resistance value R002 to R005



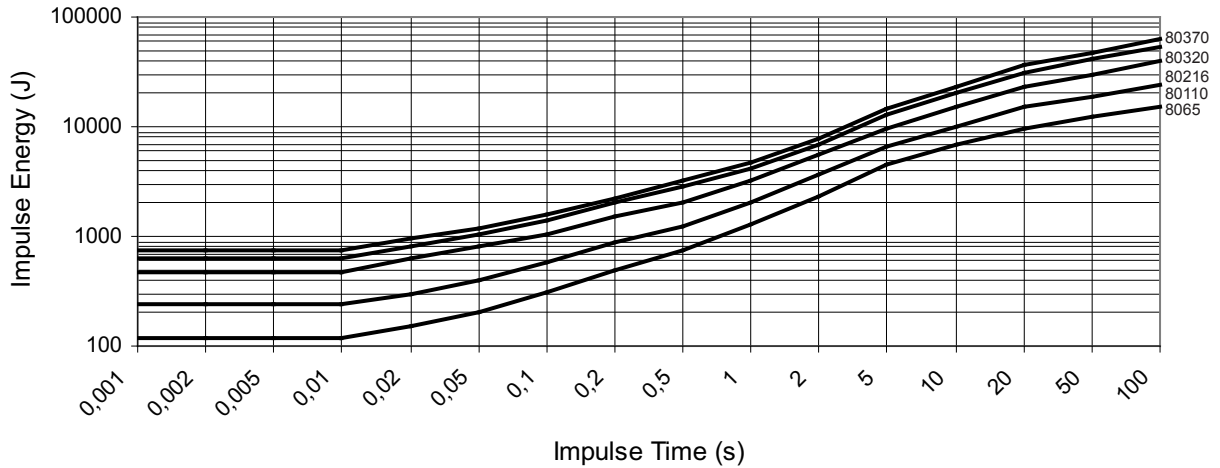
Resistance value R005 to R01



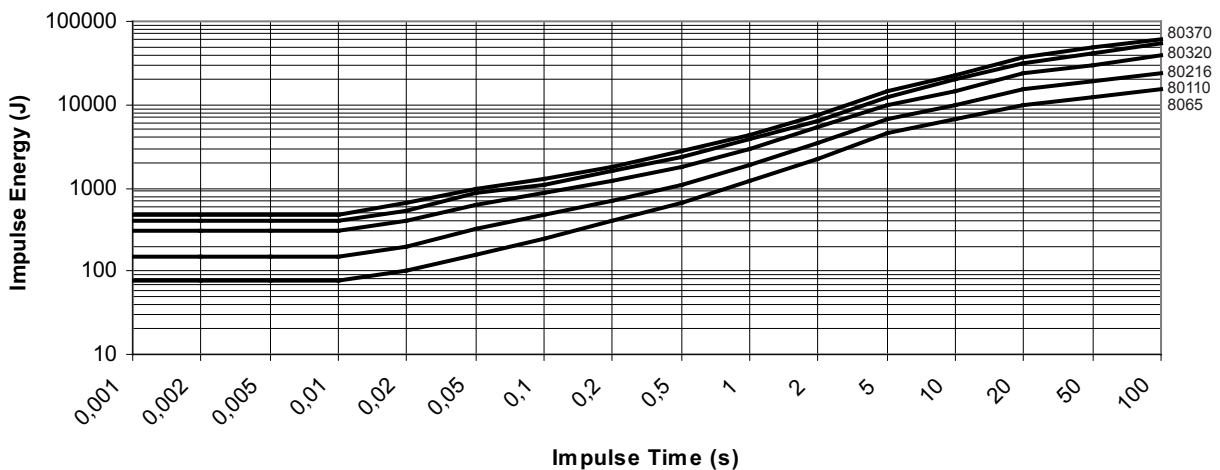
**SPECIFICATIONS** (continued)

**Stability against Impulses**  
Reference values without heatsink

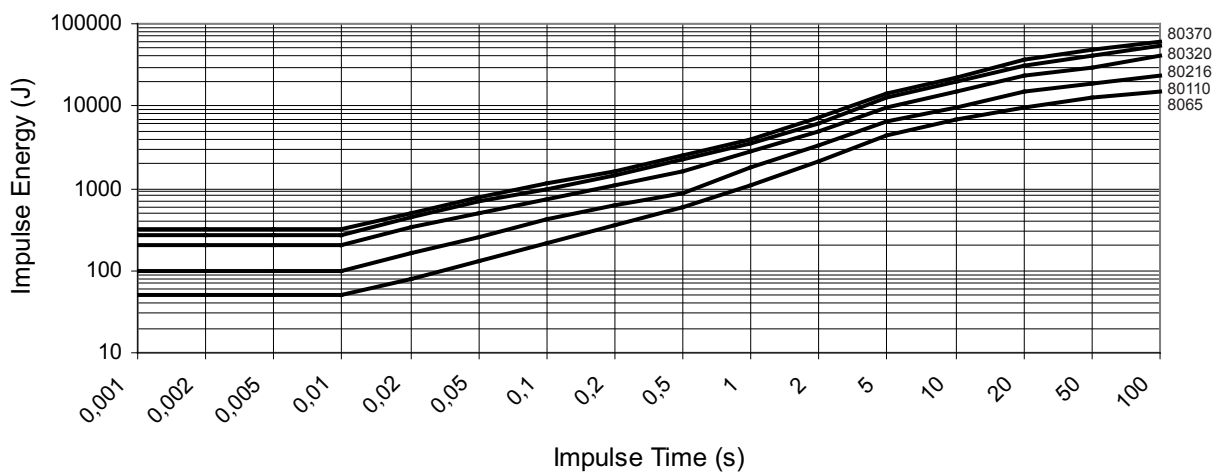
Resistance value R01 to R1



Resistance value R1 to 1R



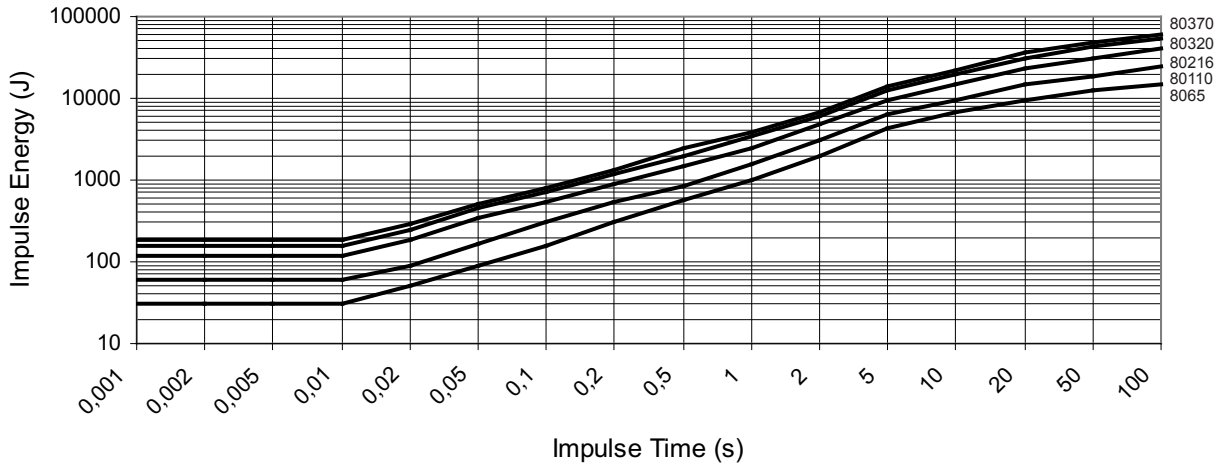
Resistance value 1R to 10R



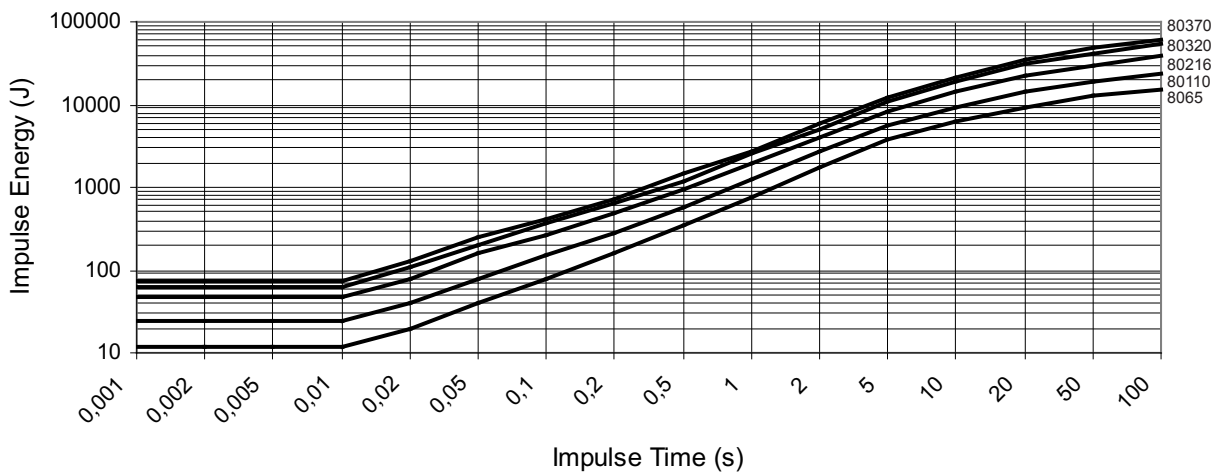
**SPECIFICATIONS** (continued)

**Stability against Impulses**  
Reference values without heatsink

Resistance value 10R to 100R



Resistance value 100R to 500R



**Lead Variations**

<b>Standard:</b>	Lead D	from to 60 A	isolated round cable (Cu / tinned)
<b>optional:</b>	Lead H1	from to 70 A	isolated Cu - flat cable
	Lead H2	from to 85 A	isolated Cu - flat cable
	Lead H3	from to 100 A	isolated Cu - flat cable
	Lead H4	from to 120 A	isolated Cu - flat cable
	Lead H5	from to 150 A	isolated Cu - flat cable
	Lead H6	from to 250 A	isolated Cu - flat cable