

# DATASHEET

**Product Name**    **Vertical Type Shrapnel Fuse Resistors**

---

**Part Name**    **PHF 2W Series**

**File No.**    **DIP-SP-091**

## **Uniroyal Electronics Global Co., Ltd.**

88#, Longteng Road, Economic & Technical Development Zone, Kunshan, Jiangsu, China

Tel    +86 512 5763 1411 / 22 /33

Email    [marketing@uni-royal.cn](mailto:marketing@uni-royal.cn)

Manufacture Plant    Uniroyal Electronics Industry Co., Ltd.

Aeon Technology Corporation

Royal Electronic Factory (Thailand) Co., Ltd.

Royal Technology (Thailand) Co., Ltd.

## 1. Scope

- 1.1 This data sheet is the characteristics of Vertical Type Shrapnel Fuse Resistors manufactured by UNI-ROYAL.
- 1.2 Elastic sheet metal, solder dot fuse, reliable circuit cut off function
- 1.3 Elastic sheet metal, solder dot fuse, reliable circuit cut off function
- 1.4 Application: Over temperature protection of industrial power supply
- 1.5 Compliant with RoHS directive.
- 1.6 Halogen free requirement.

## 2. Part No. System

The standard Part No. includes 14 digits with the following explanation:

- 2.1 For Cement Fixed Resistors, these 4 digits are to indicate the product type but if the product type has only 3digits, the 4<sup>th</sup> digit will be “0”

Example: PHF0=PHF0 type

- 2.2 5<sup>th</sup>~6<sup>th</sup> digits:

- 2.2.1 The 5<sup>th</sup> and 6<sup>th</sup> digit will be a number or a letter code.

Example: 2W=2W

- 2.3 The 7<sup>th</sup> digit is to denote the Resistance Tolerance. The following letter code is to be used for indicating the standard Resistance Tolerance.

Example: J=±5% K=±10%

- 2.4 The 8<sup>th</sup> to 11<sup>th</sup> digits is to denote the Resistance Value.

- 2.4.1 For Cement Fixed Resistors the 8<sup>th</sup> digits will be coded with “W” to denote Wire-wound type respectively of the Cement Fixed Resistor product.

- 2.4.2 E-24 series in 2% & 5% & 10% tolerance, the 9<sup>th</sup> & 10<sup>th</sup> digits are to denote the significant figures of the resistance and the 11<sup>th</sup> digit is the number of zeros following

Example: W100=10Ω

- 2.5 The 12<sup>th</sup>, 13<sup>th</sup> & 14<sup>th</sup> digits.

- 2.5.1 The 12<sup>th</sup> digit is to denote the Packaging Type with the following codes:

B=Bulk/Box

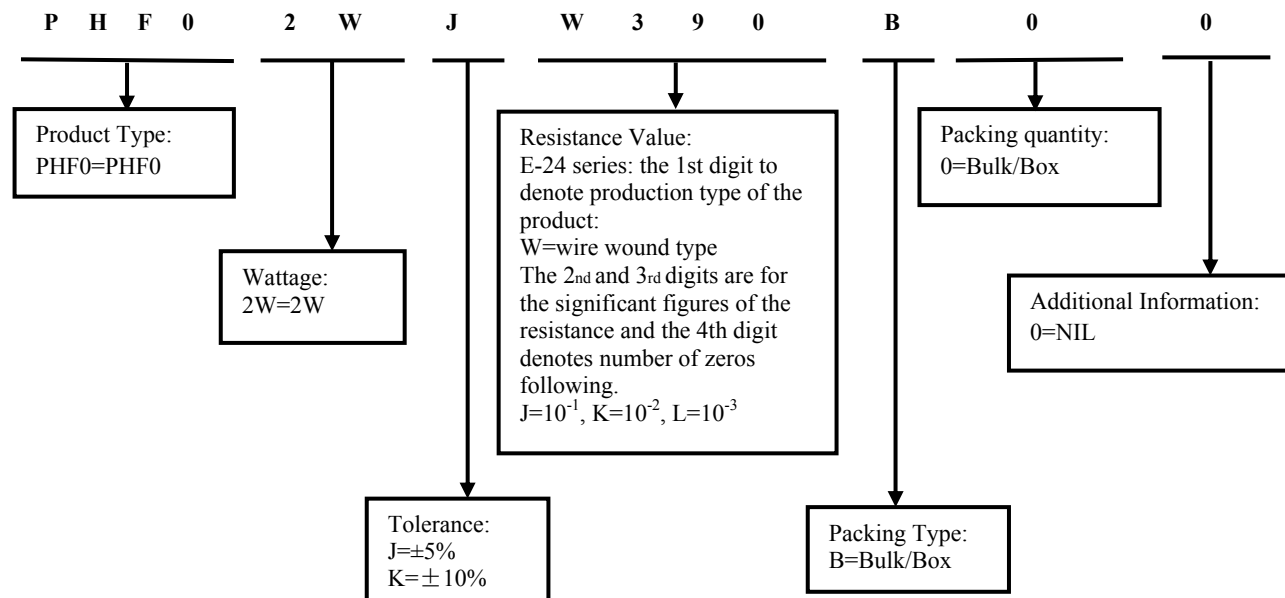
- 2.5.2 The 13<sup>th</sup> digit is normally to indicate the Packing Quantity, This digit should be filled with “0”for the Cement products with “Bulk/Box” packing requirements.

- 2.5.3 For some items, the 14<sup>th</sup> digit alone can use to denote special features of additional information with the following codes or standard product

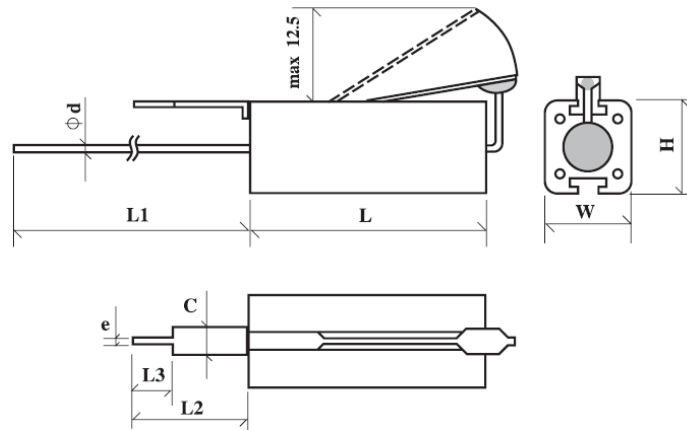
Example: 0= standard product

## 3. Ordering Procedure

(Example: PHF0 2W ±5% 39Ω B/B)

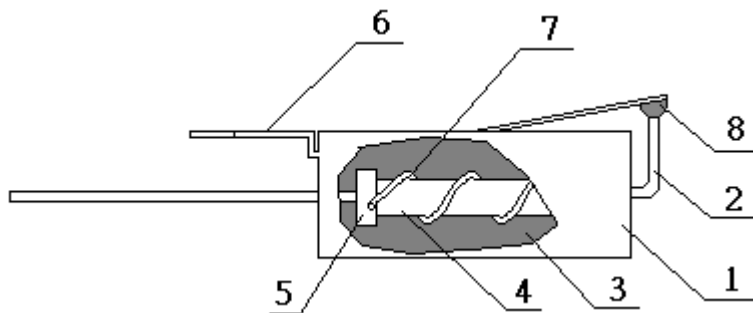


## 4. Dimension (unit: mm)



Type	Dimension(mm)									Tolerance	Resistance Range
	L ±1.0	W ±1.0	H ±1.0	L1 ±3.0	L2 ±1.5	L3 ±0.5	C ±0.1	e ±0.1	Φd ±0.05		
PHF0 2W	25.0	9.0	10.0	38.0	13.0	4.5	3.0	0.9	0.75	±5% ±10%	1Ω ~ 470Ω

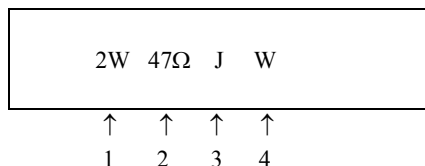
## 5. Structure



No.	Name	material generic name
1	Ceramic Case	Al <sub>2</sub> O <sub>3</sub> CaO
2	Lead	Copper Wire
3	Filling Materials	SiO <sub>2</sub>
4	Basic body	Rod Type Ceramics
5	End cap	Steel (Tin Plated iron Surface)
6	Sheet metal	P-Cu Alloys
7	Resistor	Alloys
8	Welding spot	Solder

## 6. Marking

Example:

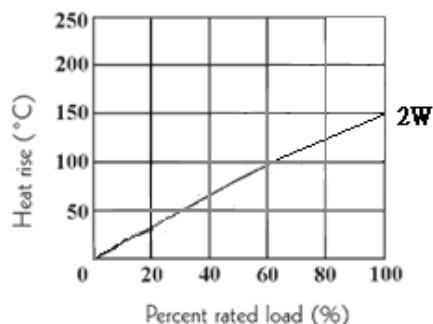


Code description and regulation:

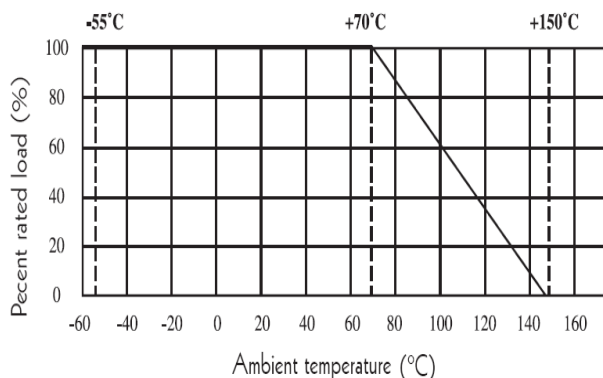
1. Wattage Rating
  2. Nominal Resistance Value
  3. Resistance Tolerance. J:  $\pm 5\%$
  4. Pattern: W: Wire wound
- Color of marking: Black Ink

## 7. Derating Curve

Heat rise chart:



Derating curve:



### 9.1 Voltage rating:

Resistors shall have a rated direct-current (DC) continuous working voltage or an approximate sine-wave root-mean-square (RMS) alternating-current (AC) continuous working voltage at commercial-line frequency and waveform corresponding to the power rating, as determined from the following formula:

$$RCWV = \sqrt{P \times R}$$

Where: RCWV = rated dc or RMS ac continuous working voltage at commercial-line frequency and waveform (VOLT.)

P = power rating (WATT.)

R = nominal resistance (OHM)

## 8. Performance Specification

Characteristic	Limits	Test Methods (GB/T5729&JIS-C-5201&IEC60115-1)
Temperature Coefficient	±350PPM/°C Max.	<p>4.8 Natural resistance changes per temp. Degree centigrade</p> $\frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6 \text{ (PPM/°C)}$ <p> <math>R_1</math>: Resistance Value at room temperature (<math>t_1</math>) ;  <math>R_2</math>: Resistance at test temperature (<math>t_2</math>)  <math>t_1</math>: +25°C or specified room temperature  <math>t_2</math>: Room temperature +100°C </p>
Short-time overload	<p>Resistance change rate is:  ± (3%+0.05Ω) max.  With no evidence of mechanical damage.</p>	4.13 Permanent resistance change after the application of a potential of 2.5 times RCWV or Max.Overload Votage whichever less for 5 seconds.
Dielectric withstanding voltage	No evidence of flashover mechanical damage, arcing or insulation break down.	4.7 Resistors shall be clamped in the trough of a 90°metallic V-block and shall be tested at AC potential respectively specified in the above list for 60-70 seconds. For cement fixed resistors the testing voltage is 2000V.
Terminal strength	No evidence of mechanical damage	<p>4.16 Direct load:  Resistance to a 2.5 kg direct load for 10 seconds in the direction of the longitudinal axis of the terminal leads.</p> <p>Twist test:  Terminal leads shall be bent through 90°at a point of about 6mm from the body of the resistor and shall be rotated through 360° about the original axis of the bent terminal in alternating direction for a total of 3 rotations.</p>
Cut-Off Temperature	Resistance must be off	When the temperature of the resistor surface is 150±20°C, the resistor Cut-Off.
Resistance to soldering heat	<p>Resistance change rate is:  ± (1%+0.05Ω) Max.  With no evidence of mechanical damage</p>	4.18 Permanent resistance change when leads immersed to a point 2.0-2.5mm from the body in 260°C±5°C solder for 10±1 seconds.
Load life	±(5%+0.05Ω)	4.25.1 Permanent Resistance change after 1000 hours operating at RCWV or Max.Working Voltage whichever less with duty cycle of 1.5 hours “ON” , 0.5 hour “OFF” at 70±2°C ambient.

## 9. Note

- 9.1. UNI-ROYAL recommend products store in warehouse with temperature between 15 to 35℃ under humidity between 25 to 75%RH.  
Even under storage conditions recommended above, solder ability of products will be degraded stored over 1 year old.
- 9.2. Cartons must be placed in correct direction which indicated on carton, otherwise the reel or wire will be deformed.
- 9.3. Storage conditions as below are inappropriate:
  - a. Stored in high electrostatic environment
  - b. Stored in direct sunshine, rain, snow or condensation.
  - c. Exposed to sea wind or corrosive gases, such as Cl<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, NO<sub>2</sub>, Br, etc.

## 10. Record

Version	Description	Page	Date	Amended by	Checked by
1	First version	1~5	Aug.15, 2023	Haiyan Chen	Yuhua Xu

© Uniroyal Electronics Global Co., Ltd. All rights reserved. Specification herein will be changed at any time without prior notice.