

DATASHEET

Product Name **Vertical Type Shrapnel Fuse Resistors**

Part Name **PHF 2W Series**

File No. **DIP-SP-091**

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1. Scope

- 1.1 This datasheet 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
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- 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 4th digit will be “0”

Example: PHF0=PHF0 type

- 2.2 5th~6th digits:

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

Example: 2W=2W

- 2.3 The 7th 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 8th to 11th digits is to denote the Resistance Value.

- 2.4.1 For Cement Fixed Resistors the 8th 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 9th & 10th digits are to denote the significant figures of the resistance and the 11th digit is the number of zeros following

Example: W100=10Ω

- 2.5 The 12th, 13th & 14th digits.

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

B=Bulk/Box

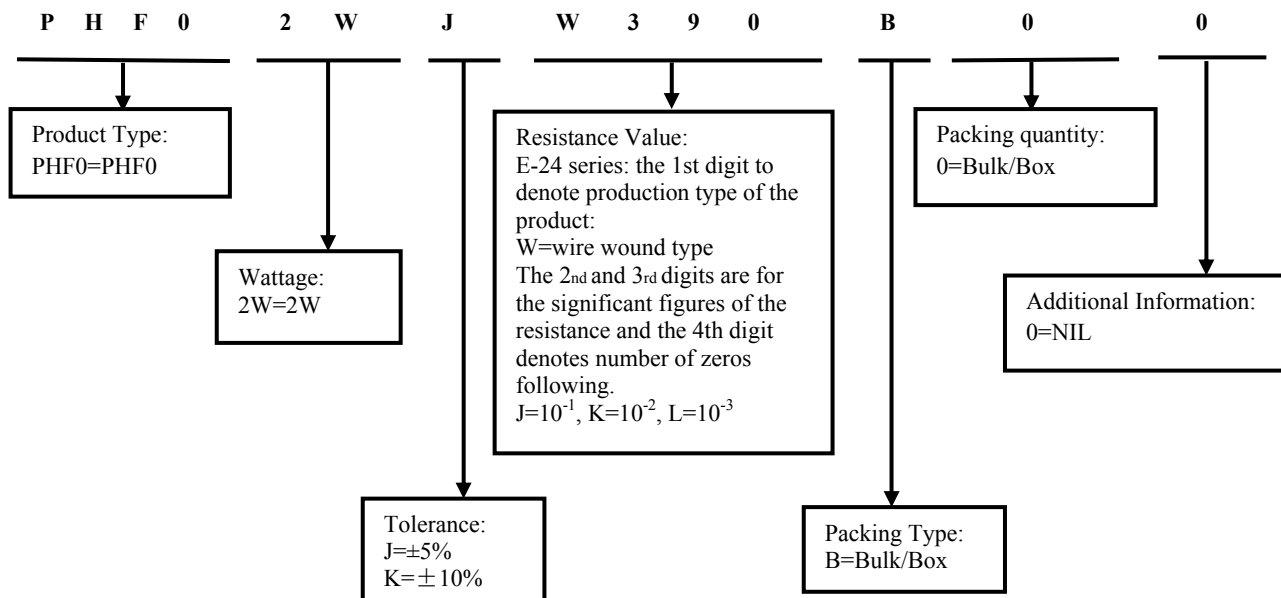
- 2.5.2 The 13th digit is normally to indicate the Packing Quantity, This digit should be filled with “0”for the Cement products with “Bulk/Box” packing requirements.

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

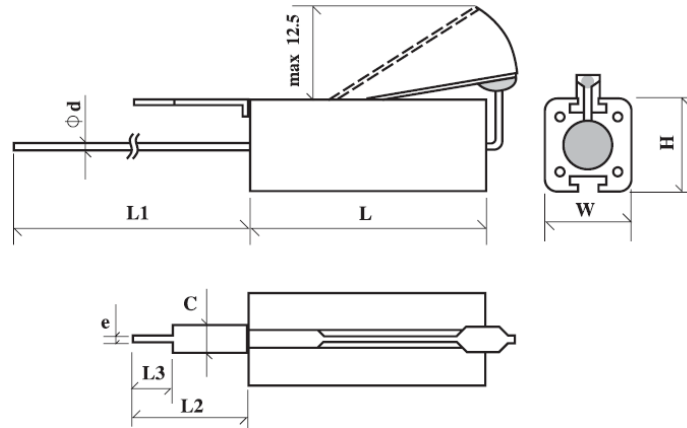
Example: 0= standard product

3. Ordering Procedure

(Example: PHF0 2W ±5% 39Ω B/B)

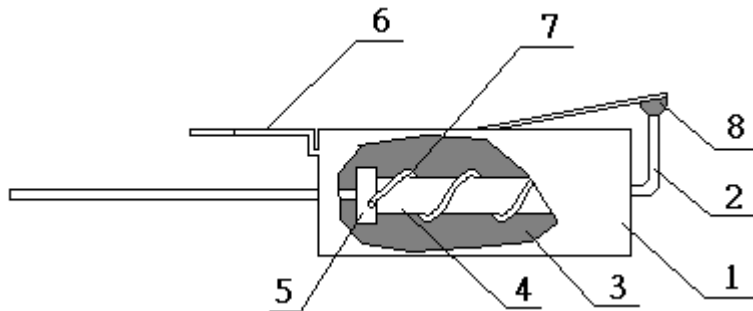


4. Dimension (unit: mm)



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

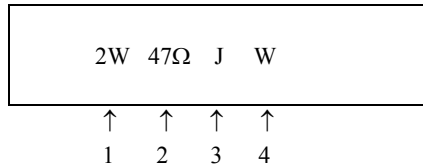
5. Structure



No.	Name	material generic name
1	Ceramic Case	Al ₂ O ₃ CaO
2	Lead	Copper Wire
3	Filling Materials	SiO ₂
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:

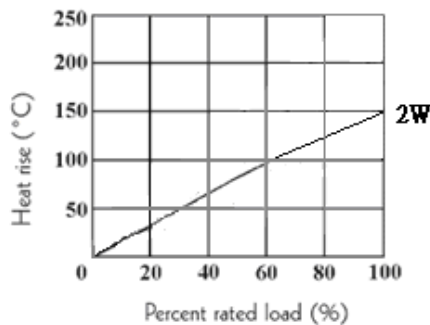


Code description and regulation:

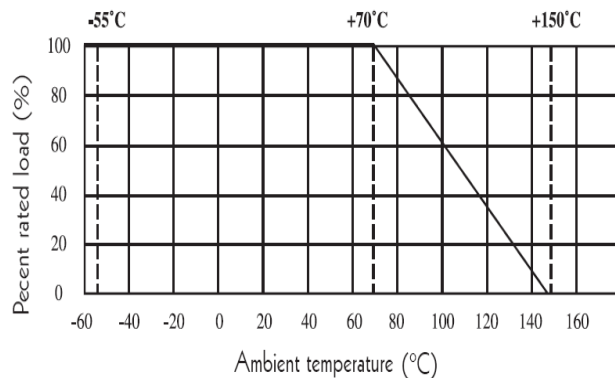
1. Wattage Rating
 2. Nominal Resistance Value
 3. Resistance Tolerance. J: $\pm 5\%$
 4. Pattern: W: Wire wound
- Color of marking: Black Ink

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	$\pm 350 \text{ PPM}/^{\circ}\text{C}$ Max.	4.8 Natural resistance changes per temp. Degree centigrade $\frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6 \text{ (PPM}/^{\circ}\text{C)}$ R_1: Resistance Value at room temperature (t_1) ; R_2: Resistance at test temperature (t_2) t_1: +25°C or specified room temperature t_2: Room temperature +100°C
Short-time overload	Resistance change rate is: $\pm (3\% + 0.05\Omega)$ max. With no evidence of mechanical damage.	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	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. 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.
Cut-Off Temperature	Resistance must be off	When the temperature of the resistor surface is $150 \pm 20^{\circ}\text{C}$, the resistor Cut-Off.
Resistance to soldering heat	Resistance change rate is: $\pm (1\% + 0.05\Omega)$ Max. With no evidence of mechanical damage	4.18 Permanent resistance change when leads immersed to a point 2.0-2.5mm from the body in $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$ solder for 10 ± 1 seconds.
Load life	$\pm (5\% + 0.05\Omega)$	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 $70 \pm 2^{\circ}\text{C}$ ambient.

9. Note

- 9.1. UNI-ROYAL recommend products store in warehouse with temperature between 15 to 35°C 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 Cl₂, H₂S, NH₃, SO₂, NO₂, Br, etc.

10. Record

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

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